▶ DOCUMENT DISTRIBUTION

Wang builds Disoss bridge

BY JOHN DIX
Senior Editor

LOWELL, Mass. — Wang Laboratories, Inc. last week increased its compatibility with IBM network environments by introducing an LU 6.2 interface option for its gateway to IBM's Disoss ("LU 6.2 to fly from Wang's wings," *Network World*, May 12).

As one of the preeminent suppliers of office systems — in particular, word processing equipment — a high degree of compatibility with the IBM document-handling standard is a critical requirement for Wang.

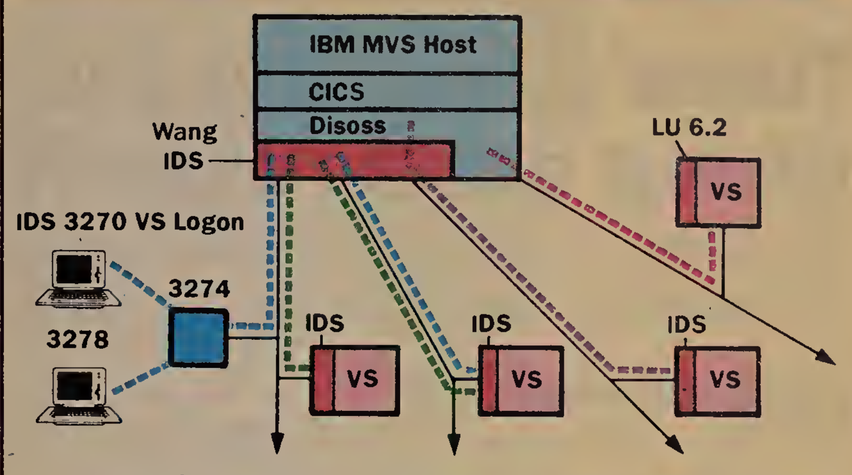
The adoption of LU 6.2 as a transport option for Disoss is a strategic shift for Wang. It simplifies the link to Disoss and makes possible further long-range compatibility goals with IBM's Systems Network Architecture.

The company also enhanced its gateway to IBM's Professional Office System (Profs) with its integration of Profs and Wang Office.

In addition, Wang introduced 3270 VS Logon software. With the package, IBM 3278 terminal users are provided access to all but the word processing capabilities within Wang Office, which is a

See **LU 6.2** page 48

Wang communications via IBM SNA networks



A new LU 6.2 Wang Office/Disoss Gateway transport option provides direct Disoss access. IDS 3720 VS Logon enables IBM terminal users to access Wang VS minicomputers.

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 3, NUMBER 13 JUNE 2, 1986

▶ PROFILE

Bellairs wears ICA, ABC hats

BY MARGIE SEMILOF
Senior Writer

For more than 40 years, the hour-long commuter train ride into Manhattan from Chester Bellairs' home in Nassau County, N.Y., has provided quiet time to mull over strategic network plans.

Bellairs is communications manager for Capital Cities ABC, Inc., chairman of this year's International Communications Association (ICA) Telecom '86 conference and most likely candidate for the ICA

☞Continued on **page 35**

▶ REGULATORY RIVALRY

Supreme Court curbs FCC rule over PUCs

Lower rates, longer write-offs may result from states' rights victory in court's depreciation declaration.

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The U.S. Supreme Court ruled last week that the Federal Communications Commission cannot dictate telephone equipment depreciation methods or related rate-making policies to state public utility commissions. The court's decision upheld state authority in setting depreciation policy for all telephone companies offering intrastate telephone service.

If the Supreme Court's decision results in slower depreciation rates for such equipment, business and residential ratepayers could reap the benefit of lower rates for intrastate service. States that favor slower depreciation could order telephone companies to lower their intrastate rates. And states could conceivably force telephone companies to pay millions of dollars in customer refunds based on the depreciation rates they would have implemented had the FCC not imposed accelerated rates earlier. Observers said that if such refunds were ordered, they would likely become the focus of legal battles.

Depreciation schedules regulate how telephone companies write off the cost of aging equipment and are part of the formulas used by regulatory

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NETWORK LINE

News

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Mining for gold can be easier and a lot more fun than finding a qualified communications manager. Page 2.

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Southern New England Telephone heralds landmark protocol processing and conversion. Page 4.

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The rumor mill won't be able to grind more speculations about Rolm's low-end telephone switch after the product debuts today in Atlanta. Page 4.

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AT&T Information Systems and AT&T Communications join forces to seal a major deal with one of the nation's largest motel chains. Page 6.

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Features

You can give your wanderlust full rein without leaving communications comforts behind in Mazda's nifty new telecom van. Page 32.

NEWSPAPER

▶ PBX PORTRAITS

CXC users speak

Say all is "Rose-y" with switch.

BY MARGIE SEMILOF
Senior Writer

Users of CXC Corp.'s highly touted Rose private branch exchange love the switch for its specialized message features and voice capabilities. But those users have yet to try the system's most trumpeted feature — its data switching capabilities.

The Rose was originally heralded by company officials and analysts as a so-called fourth-generation PBX — a voice switch that provided local net capabilities, making it as easy to network data devices as telephones. The system

See **Rose** page 8

▶ COMMUNICATIONS MANAGERS

Tulsa's manhunt is over; hiring caps reshuffle

Merging communications roles spawns complexity for those in the hiring chairs.

BY PAUL KORZENIOWSKI
Senior Writer

TULSA, Okla. — Finding a qualified communications manager can be as difficult as mining for gold. Companies often spend plenty of time sifting through piles of resumes in search of that one golden candidate.

J.M. Dowd, director of information and communications services for the city of Tulsa, mined for a communications manager for some four and a half years before he finally hit pay dirt..

In 1981, Dowd was lured away from American Airlines, which has its principal data processing operations here, to head up the city of Tulsa's DP operations. Dowd decided that the various communications responsibilities should come under the aegis of one person. Voice, data and radio networks were controlled by employees in three distinct city departments. The DP department controlled only the data network.

For more than three years, Dowd lobbied city managers to restructure the communications functions. Last June, the lobbying effort bore fruit when voice responsibilities were brought under DP's wing and a new position, manager of telecommunications, with a salary between $42,000 and $52,000, was created.

In August, a search was launched to fill that position. The city placed advertisements in local newspapers and in *The Wall Street Journal*. The ads ran in the late summer and drew more than 100 applicants for the position.

Last fall, four candidates traveled to Tulsa, where they were interviewed by a member of the city's personnel department, Dowd and a citizens advisory board made up of a professor from the University of Tulsa and an American Airlines employee.

The city was looking for someone who had a bachelor's degree in electrical engineering, and who had experience in running voice and data networks and working with

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▶ AT&T

Transponder lease may spell Skynet service woes

BY BOB WALLACE
Senior Writer

BASKING RIDGE, N.J. — Users who sign up for AT&T Communications' new Skynet Star Network Service may be susceptible to service outages and, when AT&T leases more expensive satellite transponders in 1989, face potentially higher service rates.

The Federal Communications Commission gave AT&T the go-ahead to begin offering the Ku-band service on May 20, amidst complaints from competitiors about the pricing of the service ("AT&T starts Vsat service," *Network World*, May 26).

Skynet Star Network Service is a two-way very small aperture terminal (Vsat) service that will enable users to communicate with geographically dispersed locations via satellite. AT&T signed an agreement with RCA American Communications, Inc. to lease two transponders on its K-2 communications satellite to support the fledgling service. A transponder is a satellite device that receives radio signals from earth, amplifies the signals and retransmits them to one or multiple locations on earth.

According to the lease agreement filed with the FCC, AT&T Communications will pay RCA Americom $300,000 per month for use of the two transponders.

When RCA Americom's K-3 satellite is launched early in 1989, AT&T will switch the two transponders for a pair on the new satellite.

Use of these protected transponders will double AT&T's space segment costs to $600,000 a month.

There are two general transponder classifications, preemptible and protected. Users who lease preemptible transponders may be bumped off the transponder if a protected transponder fails.

Protected transponder lessees pay a far higher monthly fee to the satellite owner for the added degree of protection.

AT&T's current lease with RCA Americom is for preemptible transponder space. While AT&T claims users of its Vsat service will be adequately insulated from satellite equipment problems, it added that the risk of the service being forced off the K-2 satellite does exist.

According to Karl Savatiel, AT&T satellite communications director, "The possibility [of the service being forced off the satellite] is there but it is very remote. Users would not be put in a severe emergency situation for a long period of time."

Guy Lewis, broadcast services director for RCA Americom, agreed the likelihood of the service being pushed off the satellite is remote. In the event of a partial satellite failure, companies with protected transponders would be bumped to spare satellite transponders. Those

See **Skynet** page 53

▶ DATA BASE MACHINES

Users look to data hook

BY PAUL KORZENIOWSKI
Senior Writer

A principal. problem corporations face when they attempt to tie dissimilar systems together is data incompatibility.

Despite an overabundance of available tools aimed at solving the problem, another technique has quietly begun to attract users' attention. A small but growing number of companies are employing an emerging technology — data base machines — as the cornerstone in an information systems architecture built around a variety of incompatible devices.

Data base machines were originally envisioned as a tool to offload host data management tasks. But some companies are using them in place of other communications facilities such as protocol converters, microcomputer-to-mainframe links and software standards such as IBM's Disoss and the ISO's X.400 protocol to link different types of processors.

A case in point is Philip Morris, Inc., which purchased a Britton-Lee, Inc. data base machine to act as a data server on a network, according to Lucy Waller, data administrator for the company's research center in Richmond, Va.

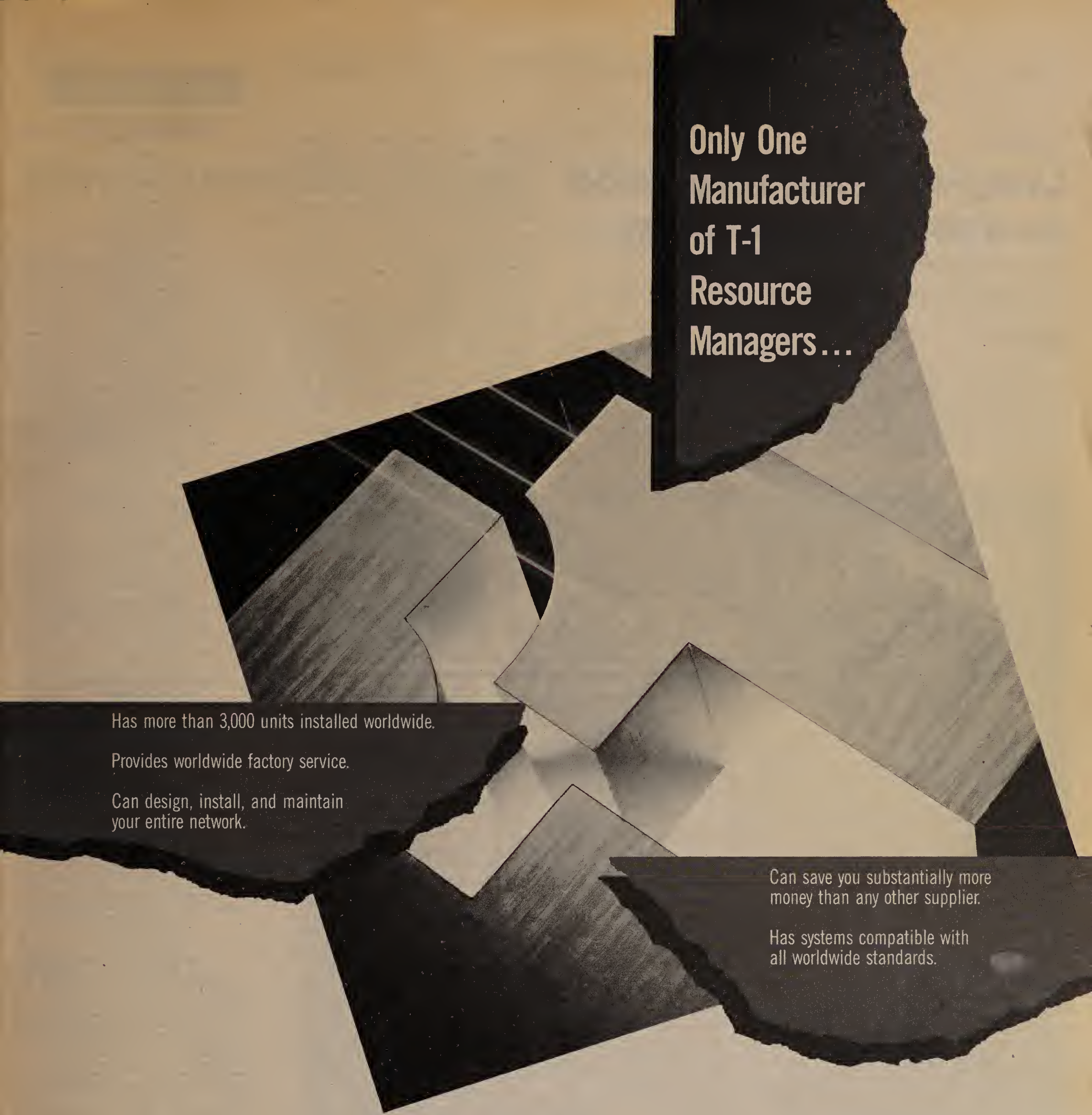
Waller reported that the company linked its Digital Equipment Corp. VAX superminicomputers and IBM Personal Computers to a data base machine through an Ethernet network. Plans have been made to link systems that use the Unix operating system with the data base machine.

"We work with a variety of operating systems, which all use different protocols," Waller said.

"We needed one set of

See **Data base machine** page 45

Correction: "IBM's ad-hoc strategy," which appeared on page 32 of the May 26 *Network World*, was written by Brian Jeffery, research director at the International Technology Group in Palo Alto, Calif.



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▶ ROLM

Long-awaited Redwood to debut at ICA today

Low-end telephone switch can be configured as key system or PBX.

BY JOHN DIX
Senior Editor

ATLANTA — Rolm Corp.'s long-rumored low-end telephone switch is scheduled to debut today at the International Communications Association's annual meeting underway here.

The Redwood, a 16-to-144 line digital switch capable of being configured as a key system or private branch exchange, fills a gap in the company's current mid- to high-end switch line. While targeted primarily at small business users, Redwood gives Rolm the product range to sell to companies that want a single switch vendor, even for small branch offices.

The Redwood had been the subject of industry scuttlebutt since the company filed a Parts 68 document with the Federal Communications Commission a few months ago. All devices that can be connected to telecommunications networks must be filed with the FCC.

A fully configured Redwood consists of three shelves, each capable of supporting six eight-line cards for a maximum of 48 lines. The switch, which has a footprint two feet square, can sustain temperatures up to 40 degrees Celsius.

At a cost of between $600 and $800 per line, Redwood can be configured as a key system to take advantage of low key system tariffs in many states. Judy Ross, Redwood marketing manager with Rolm's Colorado Springs Advanced Products Division, estimates that one-third of all states have separate key system tariffs.

When Redwood is configured as a key system, users must manually select a trunk for each call. Rolm's digital telephones, the Rolmphone 240 and a model announced in conjunction with Redwood, the 240 Basic, provide the equivalent of the row of light buttons at the base of most traditional key system telephones. The Redwood Model 1 can only be configured as a key system, whereas Model 2 can be designed as either type of system.

Configured as a PBX, which requires new software and certain new switch components, Redwood provides automatic trunk selection and features typical of larger switches, such as least-cost routing and toll restriction. Upgrading from a key system to a PBX adds 5% to 15% to the original system cost, Ross said.

The introduction of Redwood marks the first time Rolm has used industry standard signaling techniques in the sampling process used to convert voice signals from analog to digital as required by all digital PBXs.

According to Ken Batorski, general manager of the Advanced Product Division, Redwood uses industry standard pulse code modulation (PCM) to sample analog voice signals 8,000 times per second and represents each sample with an eight-bit byte, which results in the 64K bit/sec PCM digitized voice standard. Rolm's mainstream CBX products sample analog voice signals 12,000 times per second and represent each sample with a 12-bit digital word.

Rolm had to adopt PCM technology to compete in the highly competitive, price-sensitive, low-end switch market, according to Ian Angus, president of Angus Tele-Management, a Toronto-based consulting firm. "You have to use standard off-the-shelf components to achieve the lowest costs," he said.

The use of different sampling techniques means Redwood switch components are not compatible with the CBX line. But Angus said that type of incompatibility is common in the industry. For example, AT&T's System 75 is not compatible on a component level with its larger System 85.

In its initial release, Redwood will only support data communications with modems. The primary telephones used with the system, however, will be Rolmphones, phones that digitize voice at the handset, giving desktop-to-desktop data capabilities.

As with the CBX, Rolmphones are supported with 256K bit/sec Rolmlinks. Each Rolmlink consists of a 64K bit/sec digitized voice channel, a 64K bit/sec data link and a 128K bit/sec channel for control and reserve capacity.

Rolm will distribute Redwood to large accounts through its Business Communications Group and Enterprise, a joint Rolm/IBM marketing organization. According to Angus, Rolm will only use its direct sales force for contracts that involve five or more systems.

▶ PROTOCOL CONVERSION

Snet heralds services

Offerings may pare dedicated line costs.

BY SHARON SCULLY
Senior Editor

NEW HAVEN, Conn. — Southern New England Telephone Co. (Snet) last week said it plans to introduce IBM 3270 and Systems Network Architecture protocol processing and conversion services through its public packet-switching network.

If inaugurated as planned later this year, the service would be the first offered by a telephone company in the U.S. As subscribers to the service, users with 3270 terminals would be able to communicate with off-site SNA host computers by directly accessing the company's ConnNet packet-switched network.

According to the company, an immediate advantage of the service over traditional methods is the dramatically reduced need for dedicated private lines. Only one 3270 controller on the user's premises would require hard wiring to the telephone company's network node, a Snet spokesman said.

The rollout of this new service, which actually began in March 1985 when the company introduced the first X.25 protocol conversion service offered by a telephone company in the U.S., clearly establishes the company's direction with regard to network planning and integrated services digital networking.

Snet, a part of the former Bell system that is considerably less shackled by federal regulatory and judicial constraints than its counterparts, has elected to distribute intelligence freely in its public network. Most Bell operating companies vehemently oppose that tact.

But if the company compromised on what the BOCs believe to be an issue of control over the public network, it may also have shown the BOCs how to leapfrog federal regulatory barriers in their efforts to offer these enhanced services.

More than a year ago, the company chose to configure separate, tandem networks, using one network for basic voice and dial-up data communications services and the second for what federal regulators have termed enhanced services. Thus Snet, unlike BOCs still fighting to obtain waivers to sell X.25 protocol conversion services, circumvented confrontation with the Federal Communications Commission on the collocation issue.

According to Barry O'Brien, Snet's district staff manager for packet network services, the tandem networks the company has set up "are very much in line with comparably efficient interconnection (CEI)."

CEI is one of several proposed methods to be employed in meeting conditions of the recent Third Computer Inquiry ruling.

In addressing the issue of CEI, the FCC stipulated in its May 15 ruling that the BOCs could provide certain enhanced services through basic service facilities only if they made access to their enhanced services networks available in a comparably efficient manner to other service providers. CEI is the method jointly proposed by Pacific Bell, IBM and Tymnet, Inc.

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"ABC membership applied for"

▶ PRODUCT NEWS

Corvus tests net server

System based on Intel's 80386 processor.

BY BOB WALLACE
Senior Writer

SAN JOSE, Calif. — Corvus Systems, Inc. last week announced it had begun beta testing a networking product based on Intel Corp.'s 80386 microprocessor. The product will reportedly be a network server that boasts significant performance improvements over current Corvus offerings.

Norman Lombino, a spokesman for Corvus, said the as-yet-unnamed network product is expected to be announced this month. Corvus last week issued preliminary information, which officials declined to discuss. Lombino would not divulge the product's capabilities or the identity of the beta-test company, which is said to be one of Corvus' largest customers.

Eric Killorin, president of Hyatt Research in Andover, Mass., speculated that Corvus will announce a high-speed file server that will allow users to rapidly access individual files across a local network.

"Instead of pulling out half a megabyte of information," he explained, "the file server would allow you to pull out just one file at a time." The Intel chip will dramatically increase the speed of the file server, he said. "IBM's future generation of personal computers will be based on the 80386, so this would be compatible with them."

Robert Martin, a product marketing director for Banyan Systems, Inc. in Westboro, Mass., and a former field applications manager with Intel, agreed the Intel 80386 microprocessor would greatly enhance the capabilities of local nets.

Corvus discontinued marketing of its slow-selling 8- and 16-bit Onyx micros and replaced them with its 9000 Series microcomputers, which are compatible with the IBM Personal Computer AT.▣

▶ REORGANIZATION

AT&T spells out plan

BY SHARON SCULLY
Senior Editor

NEW YORK — AT&T unveiled a wide-ranging reorganization plan late last week by which it will combine its customer equipment and network services units, AT&T Information Systems and AT&T Communications, by Sept. 1.

In essence, the company said it will structure the combined resources of the two subsidiaries along four market areas, as opposed to the current line-of-business organization that the U.S. District Court imposed on the company with divestiture in 1984. Notably absent from last week's announcement were specifics as to how, and under what criteria, the company will actually merge the customer bases of the two subsidiaries.

The four major market areas are: Business Markets Group, General Markets Group, Special Markets Group and Network Operations Group. The heads of all four groups

See **Reorganization** page 53

▶ PHONE RATES

MCI cuts

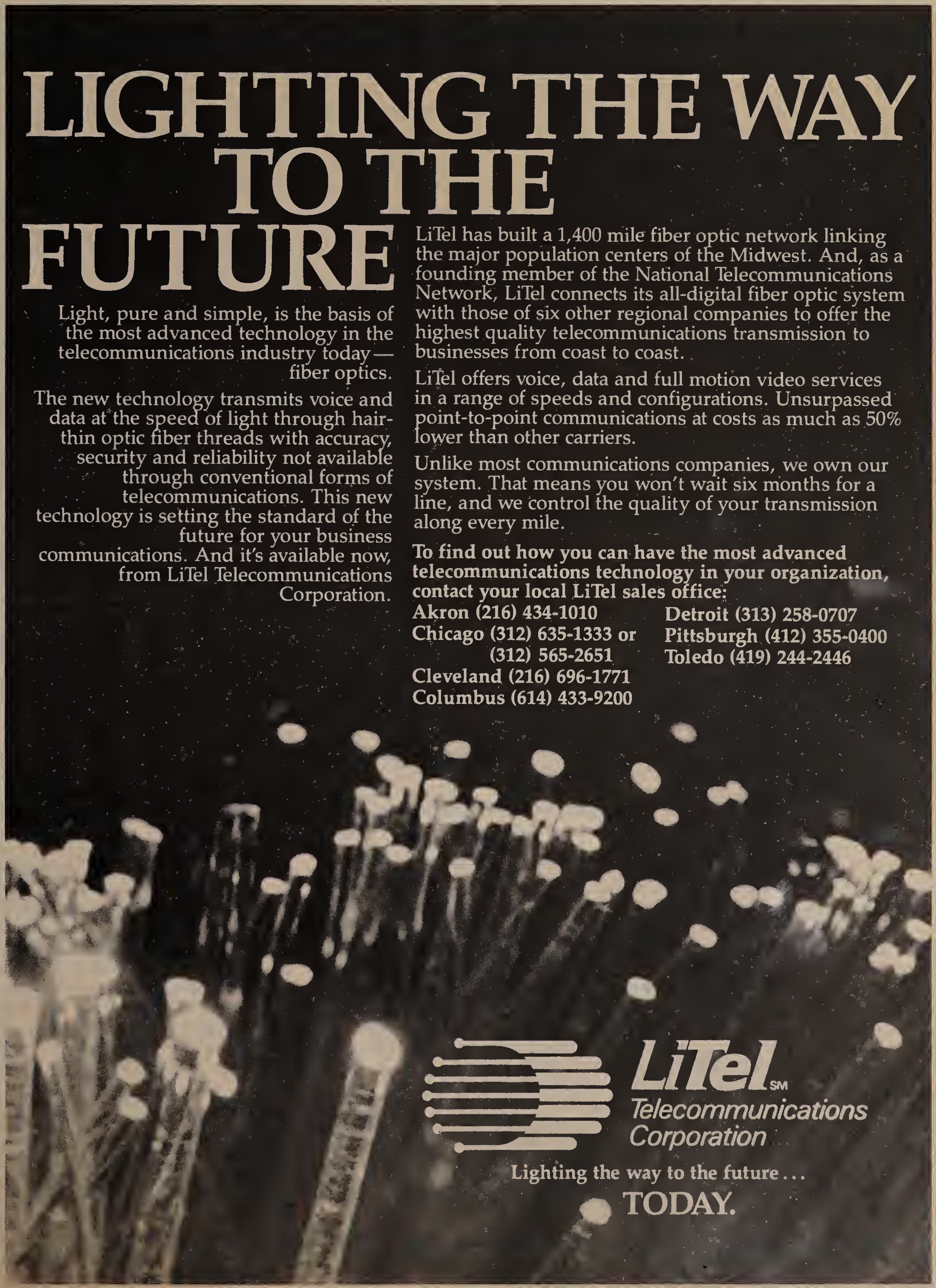
BY JOHN DIX
Senior Editor

WASHINGTON, D.C. — MCI Communications Corp. late last week cut long-distance telecommunications rates in response to AT&T's rate decreases, scheduled to take effect June 1.

MCI cut dial long-distance services up to 17%, 9.3% on average, and Wats rates by up to 15%, 9.8% on average. Rates for Prism I, MCI's version of AT&T Communications, Inc.'s Megacom, have been reduced to maintain a 10% price advantage over the AT&T service, MCI claimed. MCI's free installation program for Wats service will be continued through August 29. The new rates are slated to take effect July 1.

Beginning June 1, MCI will incorporate into the MCI billing network customers it acquired when it bought Satellite Business Systems (SBS) in February 1985. Present SBS Skynet users will become MCI subscribers and receive the same rates.

All told, the rate reductions will save MCI and SBS subscribers some $250 million, MCI reported.▣



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▶ TYMNET

UK users linked to U.S.

BY KARYL SCOTT
Washington, D.C. Correspondent

SAN JOSE, Calif. — Tymnet/McDonnell Douglas Network Systems, Inc. has announced a direct link to the UK that will give value-added network users there access to all of Tymnet's services.

The decision will also give U.S. firms lower traffic costs to the UK.

Access is made possible through an agreement with Mercury Communications Ltd. of the UK, a subsidiary of Cable and Wireless PLC Group.

Mercury is one of the only two publicly owned telecommunications carriers in the UK and was formed as a result of the deregulation of the British telecommunications industry.

Tymnet's packet-switching network will be directly linked to Mercury's X.25 network via an international X.75 gateway. The link uses Tymnet's internal T201 protocol.

The agreement allows the two firms to establish a direct point-to-point circuit between the U.S. and the UK.

In the past, Tymnet had to route outgoing traffic through international record carriers, which in turn routed it through British Telecommunications PLC, a process considerably more expensive than the new arrangement.

Mercury, which has been in the data communications business for six months, is buying Tymnet hardware and software to create its X.25 network. "Mercury is creating a virtual subnet using Tymnet nodes," said Cindy Rollis, product manager for international access at Tymnet.

Tymnet and Mercury are hoping to capture some of the growing value-added network market in the UK by providing users with services not currently available in Britain, including asynchronous-to-3270, X.PC, 3270 binary synchronous communications, 3270 SDLC and RJE/Hasp protocol support.

"UK firms such as British Telecom and Mercury have offered generic X.25 network capability, which is a different approach from ours," Rollis said.

"We're trying to add something extra. Our protocol conversion is network-resident, which saves the customer from making the added investment in customer premises equipment needed to perform the conversion. Our proprietary T201 [an internal protocol] does the conversion transparently."

Tymnet's competition, GTE Telenet Communications Corp., currently has an agreement in force with British Telecom to develop value-added network services for the UK market.

Tymnet entered the Japanese value-added network market last year through a joint venture with the Japanese Marubeni Corp.

▶ PBX INDUSTRY

Ztel rises again

User gives PNX vendor second chance.

BY NADINE WANDZILAK
Staff Writer

SALT LAKE CITY — Ztel, Inc., an independent private branch exchange manufacturer that survived bankruptcy last year, has convinced the communications manager who tried and later rejected the first Ztel Private Network Exchange (PNX) to try again with a revamped version of the PBX.

But Craig Jorgensen, telecommunications director for the state of Utah, is not taking any chances. Instead, he is renting a 700-line PNX on a monthly basis for the Utah Department of Health.

And, even though the state of Utah has lifted a legislative moratorium on equipment purchases that was in effect when the state bid for PBX equipment, Jorgensen said he may not keep the PNX. That choice, he said, depends on a final decision as to how the state will configure its overall network.

Meanwhile, in time for the International Communications Association (ICA) conference publicity blitz, the company last week unveiled enhancements to the PNX's software. Ztel also announced it recently contracted with Intelogic Trace, Inc. of San Antonio, Texas, to provide nationwide service for the PNX. About two years ago, Ztel, through its distributor US West Information Systems, installed an earlier version of the PNX for the Utah Division of State Lands. The

See **Ztel** page 53

▶ AT&T

Joint effort seals deal

BY SHARON SCULLY
Senior Editor

SANTA BARBARA, Calif. — AT&T's regional office here has landed a $40-million deal under which it will provide Motel 6, one of the nation's largest discount hotel chains, with a comprehensive telecommunications equipment, services and maintenance package.

The deal is believed to be one of the first since divestiture that was worked on by both AT&T Information Systems and AT&T Communications, Inc. The two subsidiaries were formerly prohibited by federal regulators from jointly marketing regulated network services and unregulated customer premises equipment. In separate rulemakings, the Federal Communications Commission last October and earlier this month removed most requirements for structural separation of these two subsidiaries ("FCC hands down new industry rules," *Network World*, May 19).

According to Walt Elser, an area vice-president for AT&T Information Systems, the deal with Motel 6 represents the West Coast region's largest one-shot deal since divestiture and is an "ideal application of AT&T as a sole vendor" of both customer premises equipment and long-distance services.

AT&T Information Systems will install Dimension private branch exchange-based switching equipment and telephone sets at more than 400 Motel 6 locations throughout the country. In addition, AT&T Communications will provide the customer with both local and long-distance circuits at each of these locations.

AT&T Communications, which joined AT&T Information Systems more than a year ago in negotiating the deal, will act as an agent in securing local loop hookups for Motel 6, said Tim Dolan, AT&T project manager. He said the company would arrange with the local Bell operating company at each location to initiate tariffed local exchange services for the motels and that no proposals to bypass BOC networks

See **Motel 6** page 53

▶ TRANSMISSION TECHNOLOGY

Two users choose fiber for upgrades

BY MARY PETROSKY
West Coast Correspondent

The price, speed and capacity of fiber-optic cabling convinced two California organizations to choose fiber over other transmission technologies, despite both groups' concerns about managing their networks.

The California Department of Water Resources (DWR) chose fiber-optic cable to upgrade the 20-year-old monitoring and communications system that runs along the 444-mile long aqueduct the agency manages. San Francisco-based Bank of America opted for fiber to network its new four-building data center in Concord, Calif., with the bank's existing data center in San Franciso.

The DWR originally hoped to give a fiber vendor right-of-way along the aqueduct in exchange for a complete communications system, the value of which was estimated at $9 million, according to Archie Noriega, chief of the communications office.

The DWR solicited bids from more than 60 vendors, but only MCI Telecommunications Corp "came through with an adequate proposal," said Noriega.

Currently, the agency uses dedicated leased lines operating at 1,200 bit/sec to connect its Sacramento control center with approximately 80 sites.

MCI recently began installation of the fiber system, which it values at $35 million. Under their agreement, the DWR will have control of just six of the 22 fibers in the cable, said Noriega. He also said the DWR expects to make money leasing excess network capacity to the state's Department of General Services.

The fiber, as well as communications equipment for connecting the DWR's computers to the network, should be in place by January, said Noriega. He estimates operational costs at under $500,000 per year, a savings of more than $300,000 over the current system.

Bank of America has begun moving its applications and systems programmers, approximately 1,000 people who had been scattered throughout five buildings in San Francisco, to the new data center, said Brian Tong, systems manager for the bank's Global Communications Operations. Fiber cabling runs directly from wiring closets on each floor of the four buildings on the campus to the main computer center, spread over three floors in one of the buildings. This center is linked to the San Francisco data center via a 45M bit/sec fiber pipe provided by Pacific Bell.

The fiber backbone was chosen because the programmers demand subsecond response time from a system, said Tong. Although satellite, microwave and traditional copper-based T-1 facilities were all considered, fiber won because "none of the others came close for price and availability," said Tong.

Although he's enthusiastic about fiber's benefits, Tong has reservations about the fragility of the fine glass threads, which require extra care in installation and maintenance. Fiber connectors are also easily contaminated, and test equipment for fiber cabling is immature, he said.

The DWR has never had to manage its own network, since this was handled by the various telephone companies that provided leased lines, said Noriega. Network management "is going to make our lives a little difficult," he said, adding that he expects it will take a few years to get the network well under control.

Tulsa from **page 2**

radio network equipment. Only one candidate met most of those requirements.

But the candidate balked at the city's offer, demanding more money. "There was a difference of $3,000," Dowd noted. "I thought the person fulfilled three quarters of the position's requirements, so I offered him three quarters of the possible salary."

No other candidate came close to matching the city's needs, a situation that did not surprise Dowd. "I thought the hiring process would take at least six months and probably closer to a year," he said.

Dowd ranked the remaining potential communications managers on a scale of fair to poor. "There were plenty of people who were in marketing or sales positions at telecommunications firms and wanted to make a career switch," he said. "But there were few candidates with actual experience managing a voice or data network."

After the initial hiring process came up empty, the city regrouped and tried to decide how it could best attract the few experienced managers looking for a job. A second round of ads was placed. This time, the ads were placed in a number of trade publications.

Some 70 applicants responded in the second round. Dowd and city officials pared the list down to six candidates, a group that included one candidate who fulfilled nearly all of the requirements.

Jay Ritchie, a city personnel administrator, interviewed the candidate by telephone and began to make arrangements to fly the person from Florida to Tulsa for an interview. But a short time after talking with Ritchie, the candidate decided he did not want to move to Tulsa.

City officials again went to the pool of applicants and singled out two candidates. Dale LeStourgeon, who was working as telecommunications manager at General Dynamics Corp. in St. Louis, Mo., was the leading candidate. During the first two weeks of April, the candidates were flown to Tulsa for interviews. Dowd, Ritchie and the advisory board talked with both men before agreeing that an offer should be made to LeStourgeon. He met all of the qualifications, with the exception that he did not have experience managing a radio network. A short time later, he accepted the position.

LeStourgeon had overseen a staff of more than 20 people at General Dynamics and was satisfied with his job. But he was unhappy living in a large city. Also, he had worked for the armed forces for a number of years and felt more comfortable in the public sector than in the private sector.

Even before he began looking for a new job more than a year ago, LeStourgeon was constantly being offered positions by headhunters. "I had a fairly high profile in the industry," he said. "I had spoken at the International Communications Association show and a few other shows."

In addition to the location, another reason the new job interested LeStourgeon was Dowd's aggressive plans for the position.

One change was combining voice and data responsibilities. Dowd is also trying to bring the radio network responsibilities into the DP department's domain.

Equipment changes are planned as well as management shifts. The city may trade in its Centrex services, provided by Southwestern Bell Corp., for a private branch exchange. "Our plans depend on the city's fiscal situation," Dowd said. Like many cities that flourished during the oil industry's good times, Tulsa has been hard hit during the industry's bad times.

Dowd expects a decision to be reached in two years about the possible purchase of a new PBX, significantly less time than was needed to place LeStourgeon at his new desk. ◪

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Rose from **page 1**

was delivered more than a year after its announced shipment date. Even after the system was shipped, Rose users were difficult to track down. When customers eventually did surface, none appeared to be using the switch's fancier data features, such as packet switching.

The Rose is purchased in modular units that are tied together via a proprietary local-area network. Each module supports as many as 192 ports and can operate as a self-contained communications processor and switching device. The modules operate without a hub, and each unit contains the same switching capabilities, telephony features and RS-232 connections for data.

Roger Jewett, vice-president of business development with CXC, said it is difficult even for CXC to measure its installed base of Rose PBXs. Sales figures are based on the number of modules sold, not complete systems, and most sales are handled through Bell operating companies and other equipment distributors.

"We have sold close to 70 modules," he said. "But it is difficult to ascertain whether each module sold will be a new system or added onto an existing system."

Most users recently interviewed by *Network World* said they purchased the product for its telephony features and only plan to activate the PBX's data capabilities later as needed. Users said capabilities such as automatic call distribution (ACD) are standard on the Rose, whereas they are usually sold as add-on capabilities by other PBX manufacturers.

Currently, CXC's largest Rose customer is the Internal Revenue Service, which purchased its modules from Western Union Corp. The IRS has used the systems to automate taxpayer service workstations housed in 12 IRS facilities throughout the country. An IRS spokeswoman, who declined to be identified, said the IRS purchased the Rose because it was a modular product with customized ACD software.

The IRS needed the ACD software to distribute automatically incoming calls equally among operators in regional service areas. Other PBXs typically include a uniform call distribution system that operates in a rotary hunt fashion, meaning incoming calls are shunted to the first available operator. The IRS also required extensive call reporting features, such as monitoring the length of time it takes each operator to answer a call and measuring the duration of each call.

"Our specifications for software features were hundreds of pages thick," the spokeswoman said. "CXC was the only vendor willing to custom-design ACD software. Other switches were presented as PBXs with ACD options."

The IRS has saved approximately $250,000, because the stackable Rose modules eliminated the need to build computer rooms to house the systems. The system's modular design allows the IRS to set up temporary seasonal offices by simply moving a few nodes. Another system would require the user to build a computer room and possibly install a separate remote switch. The Rose also operates using less expensive twisted-pair wiring instead of coaxial cable. The IRS has future plans to connect its PBXs with a packet-switching network and an integrated electronic mail system.

The spokeswoman said initially the IRS was concerned that a small company would be unable to service and maintain a large installation. It decided, however, to purchase the Rose after both Western Union and BellSouth Corp. signed distribution and service agreements with CXC. For tasks such as data base moves and changes, the IRS is able to use its own system administrators to perform those functions from terminals via modems.

"Other systems required a programmer from the vendor to add trunks and people to the data base," the spokeswoman said.

Users looking for custom message switching capabilities and modular PBX design turned to CXC when other vendors were unable to meet their specialized networking requirements. This user support, coupled with a recent multimillion-dollar cash infusion (see "Sony and CXC strike broad alliance," on page 9) from Japan's Sony Corp. has breathed new life into the Irvine, Calif., switch manufacturer.

CXC plans to capitalize on its appeal to a market that requires custom switching software for applications like automatic call distribution.

Ed Varden, president of Execusuite, a Northfield, Ill.-based shared tenant service, was one of the users that chose CXC's switch for its specialized message handling capabilities.

Varden's company serves individuals who operate small businesses out of single buildings and want to share common communications services. Varden's tenants require a system that can make the switch operator appear to work for each tenant's company. Using the product's built-in Rolodex-like Rosedex system and an LCD, the operator can enter the name of an outside caller and alert the tenant to the identity of the incoming calling party. ☑

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INDUSTRY UPDATE

Investments, a robust business

The term "robust," a buzzword in networking these days, accurately describes the investment banking business, if a recent statistical picture of last year's merger and acquisition activity is any indication. According to merger consultant W. T. Grimm & Co., 3,001 mergers and acquisitions were announced in 1985, a 12-year record and an 18% increase over 1984. The total value of these transactions was a whopping $179.6 billion, 47% more than the year before.

▶ PBX INDUSTRY

Sony and CXC strike broad alliance

Deal gives consumer products giant equity interest in PBX maker and control of Rose switch in Japan.

BY SHARON SCULLY
Senior Editor

IRVINE, Calif. — CXC Corp. recently disclosed a series of agreements with Tokyo-based Sony Corp. The agreements include an undisclosed level of investment in the fourth-generation private branch exchange maker by the Japanese consumer products giant.

In what company officials termed a strategic alliance, CXC also secured a joint development agreement with Sony for future research and design efforts in network systems technology. CXC and Sony also established a trade agreement that could make Sony a reduced-cost second-source supplier of equipment for CXC.

According to Joe Leonardi, founding chairman and chief executive officer of CXC, Sony also acquired an option to manufacture the Rose switch in Japan. Leonardi said CXC intends to enter into an agreement to purchase products that Sony manufactures in Japan, provided Sony's manufacturing costs are lower than those CXC incurs at its production facilities here.

Products CXC buys from Sony could be sold in U.S. or European markets, Leonardi said.

Also under the agreement, CXC said Sony would be named an exclusive distributor for the Rose switching system in Japan and its other non-North American markets. The agreement is believed to represent Sony's first direct investment in the U.S. telecommunications industry.

"Sony was interested in us because our Rose technology is a perfect marriage with its technology. The combined technologies is what Sony needs for the way it intends to approach the marketplace," Leonardi told *Network World*.

Leonardi said he approached Sony two years ago as part of an effort to secure worldwide distribution for the so-called Rose switch, an advanced technology integrated voice/data PBX.

"My long-term strategic plan was to form an alliance with a Japanese corporation and an alliance in Europe to attack those marketplaces," Leonardi said. "I went to Japan and visited a lot of companies, and Sony was the best fit. We have been working on this for over a year and a half."

Leonardi said he hopes to announce soon a similar alignment with a western European company, but declined to specify the companies with which he is currently negotiating.

Sony, known mainly for consumer electronics in the U.S., announced a year ago that it intended to pursue the telecommunications network services and equipment markets in Japan. The company has been seeking entry into the U.S. telecommunications markets for at least the past year, Leonardi said. Comment from Sony on the CXC deal was not available by press time.

According to Roger Jewett, CXC vice-president of sales, Sony is primarily interested in competing in the Japanese market at the present time. "The initial things Sony will be doing with us will be for the Japanese market. Then there will be some things happening for the worldwide market," he said.

Since its founding in 1981, CXC has been seeking distribution agreements for the Rose and, reportedly, equity partnership candidates. Unlike Intecom, Inc., which early on formed equity alliances with Exxon Corp. and Wang Laboratories, Inc.; and Ztel Corp., which formed an equity partnership with NCR Corp.; CXC has remained independent.

CXC was unsuccessful in securing a distribution deal with a regional Bell operating company until last year, when BellSouth Corp. signed to sell the Rose.

However, according to Jewett, the majority of sales realized from the BellSouth deal were due to the RBOC's efforts. He said the RBOC has installed for its own use more systems than it has resold.

Leonardi said there currently are about 100 Rose system installations, with an average line-size configuration of 110 to 125 lines. The largest installation is a 400-line site, he said.

As Intecom's vice-president of sales and business development, Bob Hawk was responsible for negotiating RBOC distribution for the switch. He left the company last month to take an integrated services digital network service planning job with Mountain Bell, a unit of US West, Inc.

VENDOR VIEW

EUGENE LOTOCHINSKI

The rough and tough revolution in phone set design

About 40 years ago, U.S. troops had just returned from World War II, and the nation was preparing to embark on an odyssey to the stars. Television was available only in black and white and the telephone had one shape and one color: boxy and black.

Less than three decades later, the technological revolution put man on the moon and color television on screens, which eventually came in sizes as large as the wall or as small as a postage stamp. Still, the telephone looked basically the same. It had not seen much aesthetic or technological headway.

Today, the telephone comes in a variety of shapes and colors, and has become an important window on telecommunications systems and networks. It offers a wealth of new communications services and features to users in widely differing environments. However, there is a tendency for users to accept new information services more readily than they accept advances in the telephones used to access them. Why is there this resistance to changes in telephone sets?

First of all, old habits are difficult to break. Many telephone users have grown so accustomed to the appearance and use of the traditional telephone that changes seem costly. Some users will be skeptical about the quality of service that the newly designed telephones provide. Advanced technological features such as programmable keys, hands-free dialing and digital data transmission can be intimidating. The array of buttons, lights and sounds associated with modern sets can seem unnecessarily complex.

A second barrier to changes in the telephone's look and function occurs when users perceive a lack of control over choice. An unrequested change of the telephone on one's desk may be jarring and may seem unnecessary. If the new set is difficult to use, it becomes a source of frustration and inconvenience.

Modern telephones can work in any communications environment, whether as a stand-alone device or behind a private branch exchange, the telephone company's Centrex service or a key system. But their full benefits cannot be realized unless changes in the way they look and function are more readily accepted. This will demand careful consideration and action by both suppliers and users.

Most telephone users aren't concerned with system architecture or network technology. They just want to push a button on their terminal and talk to someone or access information. Technical advances, therefore, should make new services easy to access. And aesthetic changes, often the most difficult for users to accept, should be

Lotochinski is vice-president of market development at Northern Telecom, Inc. in Nashville.

See **Revolution** page 10

Revolution from **page 9**

based on ergonomics and design research aimed at making the device more comfortable to use.

Suppliers of telecommunications systems must also provide the literature, tools and training necessary for explaining the new terminal's use and operation.

Users cannot be expected to accept a tool that they don't know how to use. Suppliers must rely on user feedback to refine products, both in design and function, in order to best resolve concerns and satisfy needs identified by the user.

Users, too, have a role in realizing the opportunities that technology brings to the terminal. Telephone users must be more willing to accept and welcome change. A telephone handset that differs in shape from the traditional dog bone look can be lighter and easier to hold. And newly designed number keys can enhance the speed and accuracy of dialing.

Telephone users must help guide the development of technology by voicing their needs and concerns, whether to telecommunications suppliers or to those who select new equipment for the organization.

The telephone has come a long way from its boxy and black World War II days. What hasn't changed is that the telephone, when carefully designed by manufacturers and accepted by users, is a simple tool for communicating.◪

▶ DISTRIBUTION AGREEMENT

Eagle awards contract

US West Information Systems to sell key systems as Centrex replacements.

BY SHARON SCULLY
Senior Editor

HAUPPAUGE, N.Y. — Eagle Telephonics, Inc. announced it has signed a $17.4-million distribution agreement with US West Information Systems. The company said US West Information Systems will sell its electronic key systems primarily to the federal government.

US West Information Systems — an unregulated subsidiary of US West, Inc. — disclosed that it had been awarded a series of federal contracts in the past several months. Those contracts enabled the company to provide government agencies with station equipment and small private branch exchanges.

The Eagle/One key system was the first electronic key system on the market that was compatible with both multivendor digital PBXs and central office-based services such as Centrex. The Eagle/One system is already in use by some federal government agencies. According to a spokesman for Eagle Telephonics, Eagle/One key systems are currently being used at the White House.

Subsidiaries of Bell Atlantic Corp. have bid the Eagle/One key system to the federal government for use with Centrex services. One local operating company, Chesapeake and Potomac Telephone Co., has been aggressively trying to convince Washington, D.C.-area federal agencies to remain on Centrex service.

The provision of Centrex exchange services to federal agencies is believed to account for at least half of Chesapeake and Potomac's revenue base.

However, some federal agencies are insisting on premises-based telecommunications systems — which they believe preclude the use of Centrex service — possibly as a result of the marketing efforts of US West.

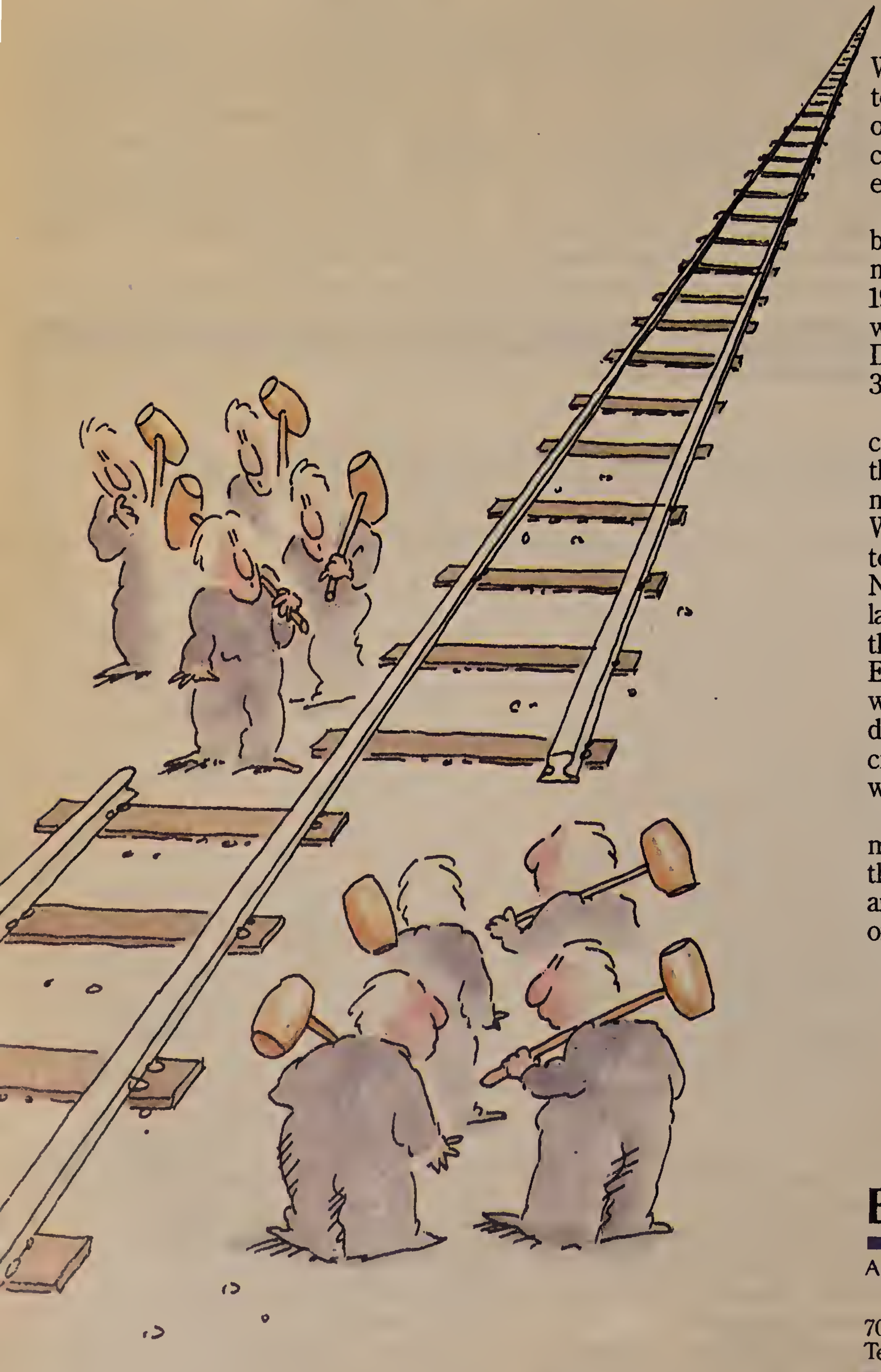
US West is also aggressively seeking government business — initially through its Interline Communications Services subsidiary. Interline, which began as a national consulting firm immediately after divestiture, was incorporated into US West Information Systems earlier this year. FirsTel, the RBOC's premises equipment marketing unit, was also incorporated into US West.

In part, the reorganization is said to be an attempt by US West to pursue federal business more effectively. The RBOC's Mountain Bell serves all of Colorado, where the federal government is the state's largest employer.

In addition, a current Reagan administration proposal calls for basing the Strategic Defense Initiative operations in Colorado Springs, Colo.

This and other federal moves to increase the significance of military bases in southern Colorado represent a considerable business opportunity for US West.

Eagle Telephonics has distribution agreements with Bell Atlantic Corp., Pacific Telesis Group of San Francisco and BellSouth Corp. of Atlanta. Eagle Telephonics was founded in 1981 and reported its first profit in 1985.◪



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TELECOM TRENDS

Telenet adds 11 overseas locations

GTE Telenet Communications Corp. is installing direct packet-switched network connections to 11 new countries, bringing its total of directly connected overseas locations to 22. The countries are Bermuda, Israel, Italy, Japan, Norway, Panama, The Philippines, Spain, Suriname, Turkey and West Germany.

▶ INTECOM

Interfaces out

Details of product announcements obscured by Wang merger news.

BY JOHN DIX
Senior Editor

ALLEN, Texas — The new products announced two weeks ago by private branch exchange manufacturer Intecom, Inc. were largely obscured by the flurry of activity that surrounded Wang Laboratories, Inc.'s acquisition of the company later that same week.

The product debuts included a stackable line interface unit that reduces the power, cooling and space requirements for Intecom's family of PBXs; an enhanced fiber-optic distribution option; a family of modular data interfaces; and an interface to Wang's Digital Voice Exchange messaging system.

The line interface unit, dubbed the Flex Interface Multiplexer (Flex IM), is compatible with all Intecom switches, including the IBX S/10, S/80 and S/80+. It will initially be used to support station equipment and not trunks and service ports, according to Hal Denton, director of product marketing with Intecom.

Each Flex IM is 17.5 inches high, 30.5 inches wide and less than 30 inches deep. Three of the units can be stacked to achieve the same capacity as three of the older, six-foot-tall cabinets. Based on new gate-array technology, the Flex IM has a footprint 89% smaller than the former interface module, uses 60% less power and requires 73% less cooling than the older unit. The device can operate at temperatures up to 100 degrees.

The Flex IM can house up to four line-card modules, each capable of

See **Intecom** page 12

CROSS TALK

JOHN DIX

Consultants rule roost

It has been said that the people who benefit most from the divestiture of AT&T are lawyers, analysts and consultants, in that order. However, time has left the consultant in the driver's seat.

At the height of confusion in 1984, lawyers were still raking in the dough in the industry's frenzied scramble to establish beachheads in every conceivable growth industry. While still prevalent, the lawyers' presence gave way in 1985 to analysts, who descended on the industry in droves to help companies navigate the postdivestiture waters.

The industry has settled some, and now it's the consultants' turn.

More than ever, the number of options available to customers is encouraging the use of outside help. The larger the task, the greater the need.

Because the single most expensive piece of telecommunications equipment is still the private branch exchange, the most common use of consultants today is in PBX switch selection.

According to industry figures, consultants are used in 80% of purchase decisions for switches of 500 lines and larger. The percentage drops with switch size.

After studying the client's situation and needs, consultants draw up requests for proposals to outline these findings. They are typically further retained to evaluate the various vendor solutions.

Ten years ago, it was not uncommon for consultants to throw the account to a vendor willing to kick back 10% of the contract's sales price. The industry has since polished its tarnished image through cooperation.

The advent of the Society of Telecommunications Consultants, now celebrating its 10th year, lent credibility to the industry by banding consultants together, establishing membership requirements and creating a code of ethics.

Interestingly, while demand for consultants has grown in

See **Consultants** page 12

▶ GAMMALINK

PC-to-facsimile link price pared

Text entry is a notable by-product.

BY JOHN DIX
Senior Editor

PALO ALTO, Calif. — Gammalink, Inc. reduced the price of its facsimile emulation product for personal computers to $995 with the announcement last week of the company's second-generation Gammafax.

Gammafax enables IBM Personal Computer XTs, Personal Computer ATs and compatibles to communicate with Group III facsimile machines over dial-up telephone lines. Documents created on a micro can be transmitted to any Group III facsimile. In the reverse application, documents can be scanned by a facsimile machine and transmitted to a personal computer for display or storage.

The product consists of a personal computer adapter board that combines a synchronous 9.6K bit/sec modem and hardware for facsimile emulation and menu-driven software. The software is used to convert Ascii files into facsimile format. Documents not stored as Ascii files by word processing systems must be converted to Ascii before transmission.

Creating documents and transmitting them is relatively straightforward. Ascii files are converted to facsimile format and sent by dialing the remote facsimile machine and hitting a transmit button. Receiving documents from facsimile machines requires attended operation and additional hardware and software.

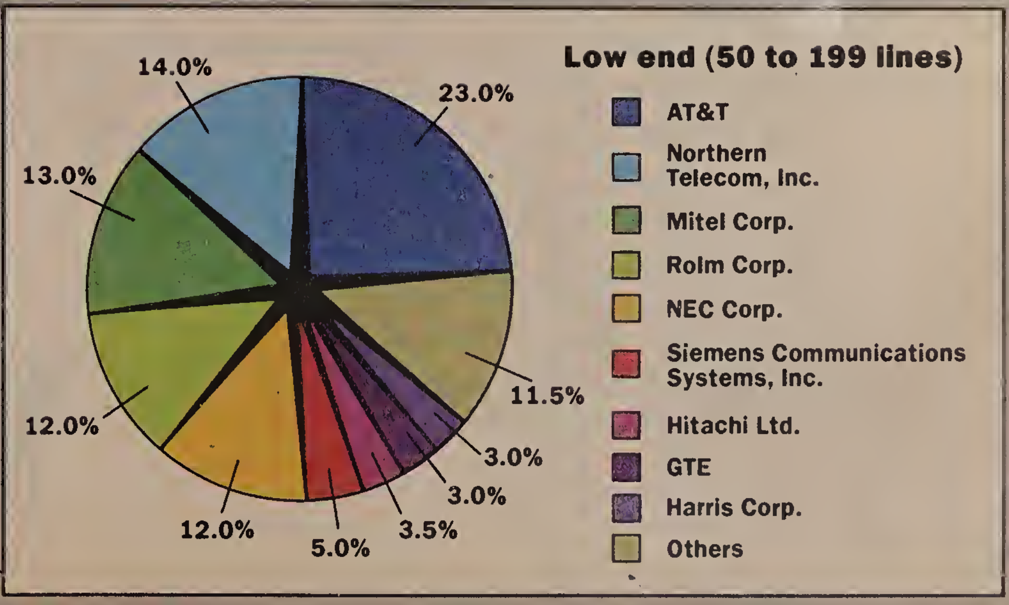
Gammafax customers can use a Y coupler to connect their micro and telephone to the same telephone line. After receiving a call from someone who wants to send a facsimile, the user would have to exit any application on the personal computer and then put Gammafax into receive mode.

Because documents are transmitted as graphic images, personal computer users must have a graphic adapter card in the micro to display the image. Gammafax supports IBM's Color Card and its Enhanced Graphics Adapter as well as Hercules Computer Technology's monochrome graphics card. A graphics printer, such as a dot matrix or laser printer, is required to print images. The images are stored as binary disk files, one file per page.

To manipulate images, which may contain text and graphics, an additional paint program, called Dr. Halo II from Media Cybernetics, Inc., is required. After calling up an image from the disk, Dr. Halo II can be used to add or delete informa-

See **Gammafax** page 12

Vendor shares in the competitive low-end PBX market



SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Intecom from **page 11**

supporting four Flex Port line cards, for a total of 16 line cards per unit. These line cards support up to 32 voice/data lines. Fully configured, each Flex IM has a maximum of 512 time slots, which are equivalent to one voice or data channel. A stack of three units can support 1,536 time slots in 6.2 square feet of floor space.

Using the enhanced fiber distribution product called Fiber II, the Flex IM and existing IBX products can be interconnected at distances up to 40,000 feet, more than twice the distance previously supported. This would enable the small Flex IM to be located near the user population.

To add data capabilities to former voice systems, Intecom introduced the ADI-100 and ADI-101. The ADI-100 is a desktop asynchronous data interface unit that works with the ADI-101, the complementary piece of hardware that sits on the switch side of the line. Communications over two twisted-pair wires can reach speeds up to 19.2K bit/sec.

Wang's partial ownership of Intecom encouraged development of an interface between Wang's Digital Voice Exchange message system and the Intecom proprietary voice message system even before Wang bought the company. Integrated features of the system include automatic call answering and a message-waiting indicator. The interface option will be available in the fourth quarter.

Intecom said it has not finalized pricing for its new products, but would probably release the information at the International Communications Association's annual meeting slated to get under way today.

Gammafax from **page 11**

tion or to merge the file with other graphics files.

Although the file may be strictly text, it is still stored and displayed as a graphics image; the computer builds each displayed character dot by dot, instead of interpreting a single byte of Ascii code into a fully formed character.

Because the graphic images are stored as binary files, they can be shared with other personal computers on a local network. To display a file, however, each micro would need Gammafax software or Dr. Halo II. Gammafax software is not copy protected, so it can be shared by multiple users on a network.

Although local facsimile machines can be used to input documents to a personal computer outfitted with Gammafax, users that install Gammafax in place of a facsimile machine can add an inexpensive scanner to achieve the same result. Gammalink will provide Gammafax users a free program called Faxs.Exe that will support the Canon Scanner, a $1,200 device made by Canon U.S.A. that is connected to a personal computer through an adapter board.

Gammafax is available from Gammalink, 2452 Embarcadero Way, Palo Alto, Calif. 94303.

Consultants from **page 11**

proportion to the growth in the number of suppliers and types of equipment available, consultants still shop mainly by price. By their own admission, price per-line is the major consideration in roughly 80% of PBX purchase decisions.

That is not to say the lowest priced system will always get the bid. In fact, as a rule of thumb, consultants often throw out the lowest and highest priced vendor proposals.

Purchase price is less of a consideration for companies that choose their own systems. Company employees are typically more willing to buy systems based on their company's long-term goals and can more easily sell higher priced systems to management.

Consultants are in it for the long term. Demand for their services can only grow with the proliferation of options.

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DATA DELIVERY

> “Last month, for the first time, IBM published its network management architecture specifications. Customers and other manufacturers will now be able to send alerts to our network management system.
>
> **William Warner**
> manager of network management products
> Communications Products Division
> IBM
> Raleigh, N.C.

▶ NETWORK SECURITY

A threat from without

Expert speaks on spies, growing need to safeguard data.

Last month, Digital Equipment Corp. won a trade secrets case involving Charles Hess, a former DEC senior engineer. Hess was prevented from disclosing confidential information to Emulex Corp., which fired him four days after he began working for the company. Emulex manufactures storage products for DEC and IBM processors.

The problem of departing employees taking trade secrets with them to their new employers has been well documented. But Robert P. Campbell, president of Advanced Information Management, Inc., a Woodbridge, Va.-based consulting firm, thinks many companies are ignoring another way competitors can obtain confidential corporate data — breaking into company computer systems. Recently, Network World *Senior Writer Paul Korzeniowski spoke with Campbell about how user networks can be vulnerable to corporate espionage.*

How many instances of corporate espionage have you encountered?
I know of two or three instances where a computer system has been penetrated with the intent of industrial esponiage. I am not at liberty to talk about those cases.

Is the problem limited to high-tech companies?
No. I am aware of cases in other industries. Of course, there is a lot of information stored on high-tech companies' systems, and that makes them attractive targets.

Robert P. Campbell

Who makes the decision to become involved in corporate espionage? Do companies condone this type of behavior?
I don't see a trend for Company A using this type of espionage against Company B. What I see is a third party becoming involved and an underground industry developing. The third party collects informa-

See **Security** page 16

DATA DIALOGUE
PAUL KORZENIOWSKI

Big Blue's lightning-fast moves may force users to make tough choices

IBM demonstrated last month why so many companies that tread on Big Blue turf often end up filing Chapter 11 bankruptcy reports. IBM again demonstrated that it will take whatever steps are necessary in order to gain an edge on a competitor. Faced with a challenge, the company can react swiftly, furiously and much more nimbly than one would expect from a $45-billion conglomerate.

On Monday, May 19, NCR Comten, Inc. made its most important product announcement in years: the NCR 5660, a huge front-end processor targeted at very large IBM shops. The machine is equipped with 16M bytes of storage and can be used in place of multiple IBM 3725s, the company's top-of-the-line front-end processor offering.

On Tuesday, IBM responded with three product announcements that once again put NCR on the defensive. IBM enhanced its 3725, adding 1M byte of memory to its storage and tweaked some of the line speeds for better throughput. Despite those enhancements, the NCR 5660 still dwarfs the IBM 3725 in power and capabilities.

However, IBM also added a low-end front-end processor, the IBM 3720, which is aimed right at NCR's bread and butter, NCR 5620 and 3650. IBM added a new release of Vtam to NCR's woes. Each release of Vtam includes new front-end processor software, and keeping pace with the latest release of Vtam has been a significant problem for NCR. The company had fallen two steps behind Big Blue. With the 5660, the company had finally caught up with IBM.

However, with the new release of Vtam, NCR has once again fallen behind IBM. Because the 5660 does not support Vtam 3.1.1, customers will not be able to install IBM's new network management offering, Netview, which was announced with the new front-end processor offerings.

Customers will have to decide what they want more: additional space, which the 5660 offers, or new network management software, which the 3725 can support.

Some large corporations have been running out of floor space and may opt for the NCR offering. However, these companies may be handicapped in the future, for one can be sure that new IBM software will require the new release of Vtam.

So, IBM is forcing its users to make a difficult choice if they turn to NCR offerings, which makes NCR's life very tough.

Tough also accurately describes IBM's latest move. The timing of the two companies' announcements was too close to be a mere coincidence. The fact that the 3720 is currently available indicates that IBM was holding this card up its sleeve, daring NCR to show its hand.

Now that both NCR and IBM have thrown their cards on the table, the question becomes, "What kind of hand is Amdahl Corp. holding?" Amdahl's share of the front end-processor market has been slipping in the last few years. Unlike NCR, Amdahl had been licensing a front-end processor from IBM and including it with the Amdahl line.

Amdahl had a fairly successful line of products that were compatible with the IBM 3705. When Big Blue introduced its 3725, the company took a lot of the features that were stored in the front-end processor software and placed them in microcode. This created some problems for Amdahl. The company's microcode had to resemble IBM's code closely, but if it were too close, Amdahl might be sued.

Amdahl has been relatively quiet recently. However, the company has to respond to the recent IBM and NCR announcements. Growth in the front-end

See **Big Blue** page 16

IBM INSIGHTS

Come out, come out, wherever you are. The long-awaited IBM 3274 Model 81C was not included in the company's communications product blitzkrieg last month. The new controller may replace the Token-Ring Network and the IBM laptop computer as the longest running rumor in industry history. No one seems to be really sure why the product hasn't been unveiled. Some analysts speculated that IBM simply has too many communications products to release this year and hasn't been able to squeeze the new controller into a busy schedule. Others said that there's no pressing reason to announce the product, so Big Blue will wait until it feels ready.

What's an SNA? Computer Technology Research Corp. in Patchogue, N.Y., has published *SNA: An IBM Standard*, a history of Systems Network Architecture. The 70-page report supplies an overview of how the architecture has changed in the last 12 years. The report costs $110. Call (516) 654-5398 for information.

Anything else? As IBM waded into Digital Service Unit waters last month, a question emerged, "What market would Big Blue next stick its big toe in?" Two obvious choices are the T-1 multiplexer line and central office switches. Another possibility is the packet assembler/disassembler (PAD) market. With the recent IBM enhancements for transmitting data from X.25 packet-switched networks to SNA, IBM may be looking to team up with or purchase a PAD vendor.

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** Ethernet is a registered trademark of Xerox Corp.

AT&T
The right choice.

Security from **page 13**

tion, such as corporate trade secrets, on its own and then tries to sell the information. Individuals then act on their own behalf and use the information to promote their stature in a corporation.

Who are these third parties?
They are not limited to a single group. As the cost of R&D increases, so does the value of trade secrets. The economics of people going out of their way to acquire trade secrets for resale is becoming very attractive.

Have there been many cases where the employee has been caught?
There have been a few examples where an individual has been fired or prosecuted for gaining a competitor's trade secret.

What sort of tools do the culprits use to gain access to a company's confidential data?
The techniques are not very sophisticated. At many companies, security is weak. The culprits gain access through a compromised password or ID.

What sort of telephone lines are used to access the system?
Dial-up lines are the most readily available. In one instance, we found a company's telephone number on a bulletin board and passed that information on to the company's security officer. The company's records showed that access on that port increased 78% one month and 180% the next month. That port was used for the company's sensitive R&D computer.

Are spies as prevalent as hackers?
Certainly not. Espionage is a serious criminal act and will not be committed unless there is a possibility of significant monetary gain. Espionage is not as prevalent as unauthorized access, but its long-term losses are potentially greater.

Do companies still do a poor job of protecting their vital resources?
Yes. We still find companies that have not deleted the installation accounts supplied by the vendor. These accounts are used to bring the system up initially, but many users fail to change them later. We continue to find systems with sensitive information that is wide open to dial-in access without proper protection. Increasingly, we're finding password systems that are mismanaged or not properly implemented.

Why do companies have such lax security procedures?
They do not appreciate the risk. The more systems we work with, the more convinced I am that there is no such thing as a nonsensitive system. Decisions about protecting data start with an understanding of what a company has that is valuable. Most companies are satisfied with a general assessment of their security needs.

Are there tools available currently that supply security for a complex multivendor network?
I haven't seen any tools yet that allow us to deal with distributed security. We need the ability to take mainframe security packages and have them work with features on other systems. That capability is at least three to five years down the road. ☑

Big Blue from **page 13**

processor market is linked to growth in the mainframe market, and no one is predicting gold rush days in that market. Development and maintenance of front-end processors is an expensive proposition, and companies need a hefty return on their investment.

Some very serious and very tough players have raised the stakes in the front-end processor market. It will be interesting to see who'll be left sitting at the table and who follows the lead of other Big Blue competitors. ☑

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FACTORY COMMUNICATIONS

> “I’ve got good news and bad news. The good news is carrier-band products will be available in 1986. The bad news is there is no carrier-band standard yet.
>
> **Chris Williams**
> Eastman-Kodak Co.
> During carrier-band update at the MAP/TOP users group meeting in Seattle

▶ PROCESS MANUFACTURING

MAP study findings uncovered

Soon-to-be-released white paper cites user concerns for safety, cost and proper media for factory floor environment.

BY BOB WALLACE
Senior Writer

The Manufacturing Automation Protocol Process Industry Initiative’s yet-to-be-published white paper on the potential impact of the factory communications standard pulls no punches.

Although MAP has won wide acclaim from such discrete manufacturing companies as General Motors Corp., Ford Motor Co., Whirpool Co. and John Deere and Co., process manufacturers have, with few exceptions, approached the highly touted communications standard cautiously (see “MAP impact,” *Network World*, April 7).

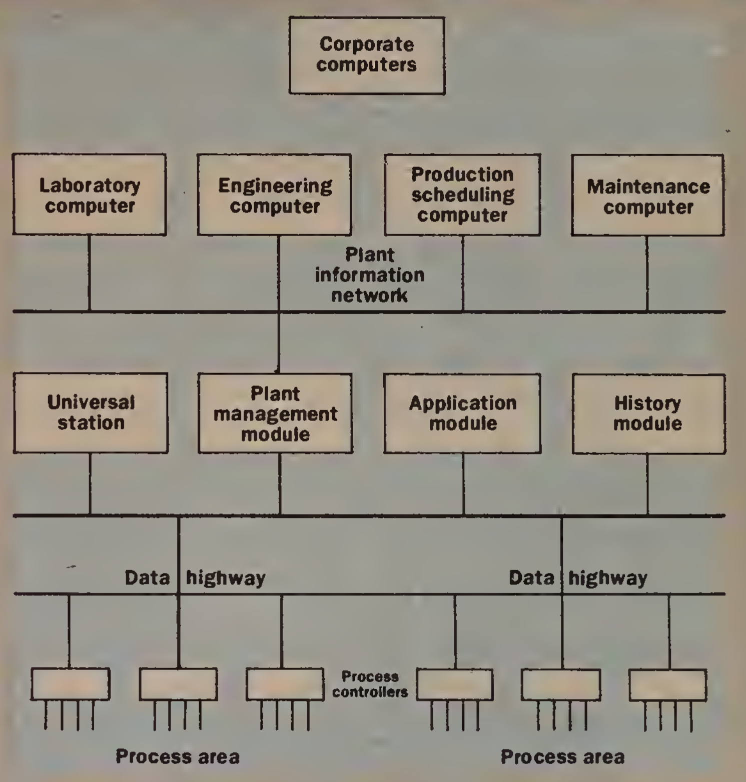
Process manufacturing differs markedly from so-called discrete production. While discrete manufacturing involves building a finished product from a series of standalone components, process manufacturing is the creation of goods from such nondistinct components as chemicals, plastics and pharmaceutical elements.

Several of the nation’s largest process manufacturing corporations joined forces in January — in a group dubbed the MAP Process Industry Initiative — to study the emerging MAP standard. The group has identified issues that must be resolved if such companies are to implement MAP technology successfully. *Network World* recently learned of the findings contained in the white paper, which is expected to be published in August, that sprang from that research effort.

Bill Veeneman is chairman of the MAP Process Industry Initiative and a member of Procter & Gamble Co.’s management systems group. He helped write the white paper and has labored exhaustively to develop awareness of MAP within Procter & Gamble and throughout the process manufacturing industry. Veeneman said the white paper was designed to address the need for communications between dissimilar factory floor equipment within process

See **White paper** page 18

An example of an integrated process manufacturing system



SOURCE: ARCHITECTURE TECHNOLOGY CORP., MINNEAPOLIS, MINN.

FACTORY FACTS

BOB WALLACE

There’s one way to catch a moving car

It’s time for prospective Manufacturing Automation Protocol and Technical and Office Protocol equipment users to head back to school.

Many of the attendees of the recent MAP/TOP users group meeting spoke intelligently with one another and to session speakers and network implementors on a variety of MAP and TOP issues. However, members of the meeting’s silent majority did not appear to possess a working knowledge of the many facets of the factory and office communications standards.

For those users who have not closely followed the two movements, getting up to speed on MAP and TOP is like trying to grab hold of a car as it speeds past you. There are users who know little more about MAP than that it is being hyped by some as the instant answer to all factory automation problems. There are also users who think Manufacturing Messaging Format Standard (MMFS), pronounced Memphis, is a large city in Tennessee. And what should users make of carrier band? Are pigeons really used to send messages back and forth in factories?

There is a wide rift between General Motors Corp. engineers and manufacturing systems staff and the rest of the factory networkers when it comes to understanding MAP. There is a very critical need for MAP education and only a few organizations have rushed to fill this void.

The MAP users group itself offers a seminar that provides an introduction to MAP that is usually held the day before the commencement of the MAP/TOP users group meeting. The Society of Manufacturing Engineers offers truckloads of books, papers, cassette recordings and videos that cover various aspects of MAP, but if you don’t speak the language, you probably won’t be able to read the book.

Three companies are among the abbreviated list of organizations that provide seminars or tutorials on MAP. Universal Computer Applications of Southfield, Mich., Shipstar Associates of Newark, Del., and Zatyko Associates of Tustin, Calif., offer such necessary MAP schooling. The trio also offers primer seminars on the topic of the International Standards Organization’s Open Systems Interconnect reference model.

There has been much talk — and sadly, that’s all it is — of assembling a glossary of MAP and TOP terms. Such an aid would be a godsend to users, but it would be a nightmare to assemble. The problem with attempting to create a document explaining the definitive word on MAP is that MAP is constantly changing. Because the specification is composed of established *and* evolving standards, it

See **School** page 18

INCIDENTALS

Contrary to the report given in “MAP movement gains momentum” in the May 19 issue of *Network World*, General Motors Corp.’s East Pontiac, Mich. plant will not reach full production status for several months.

What’s all this talk about Manufacturing Automation Protocol starter kits? Honeywell, Inc., Concord Data Systems, Inc. and Industrial Networking, Inc. all offer these kits to help prospective MAP networkers become better acquainted with the factory technology. Vendors claim the kits have been a big success, while user response to the kits has ranged from lukewarm to ice cold.

One attendee at the recent MAP/TOP users group meeting went as far as to claim these starter kits are a sales gimmick designed to trap users into further purchases of MAP equipment. Vendors have complicated attempts to put together a definitive word on the starter kits by refusing to divulge names of users who have purchased them.

The nagging question of how users can best retrofit existing fac-

See **Incidentals** page 18

School from **page 17**

would be difficult for any individual or organization to write a comprehensive story of MAP.

The best way to be kept abreast of MAP and TOP developments is to join the MAP/TOP users group. The best way to develop a working knowledge of MAP and TOP is to attend one of the "Understanding MAP" tutorials or to contact one or more of the three MAP education companies listed above.

Once users have gained a sound working knowledge of MAP, they will begin to learn how this user-driven movement might affect their organizations, their future automation plans and their companies' abilities to compete in both domestic and global markets. ◻

White paper from **page 17**

manufacturing facilities.

"So much of what we hear about MAP is theory and opinion instead of fact," Veeneman explained. "To develop interest in MAP, we have to run our own tests of it. These tests will establish facts about the technology."

Veeneman said safety tops the concerns list of process manufacturers exploring the possibility of marrying MAP technology to factory floor equipment. Because process manufacturers handle corrosive and explosive materials, stringent safety measures must be taken to avoid accidents.

If the process industry joins the MAP movement, vendors will install broadband, coaxial-cable-based local nets, or plant information net, on the factory floor (see figure at right). These systems will operate at either 10M bit/sec or 5M bit/sec.

The white paper also reflects process manufacturers' keen interest in carrier-band technology. A wide variety of factory floor devices in a certain area or work cell can be connected to a carrier-band subnetwork. These subnetworks could then be connected to the backbone factory net. The systems will most likely operate at either 5M bit/sec or 1M bit/sec.

Much confusion exists among process manufacturers as to what technology to incorporate at the lowest factory networking level. A transmission media for these nets has not been decided upon, although twisted-pair wiring appears to be the front-runner. Robert Wing, strategic technology management group leader with Procter & Gamble's engineering division, explained that these low-level data highways must be inexpensive in terms of device connection costs. They must also be able to connect thousands of devices, such as gauges, controls, sensors and indicators, on a single factory floor.

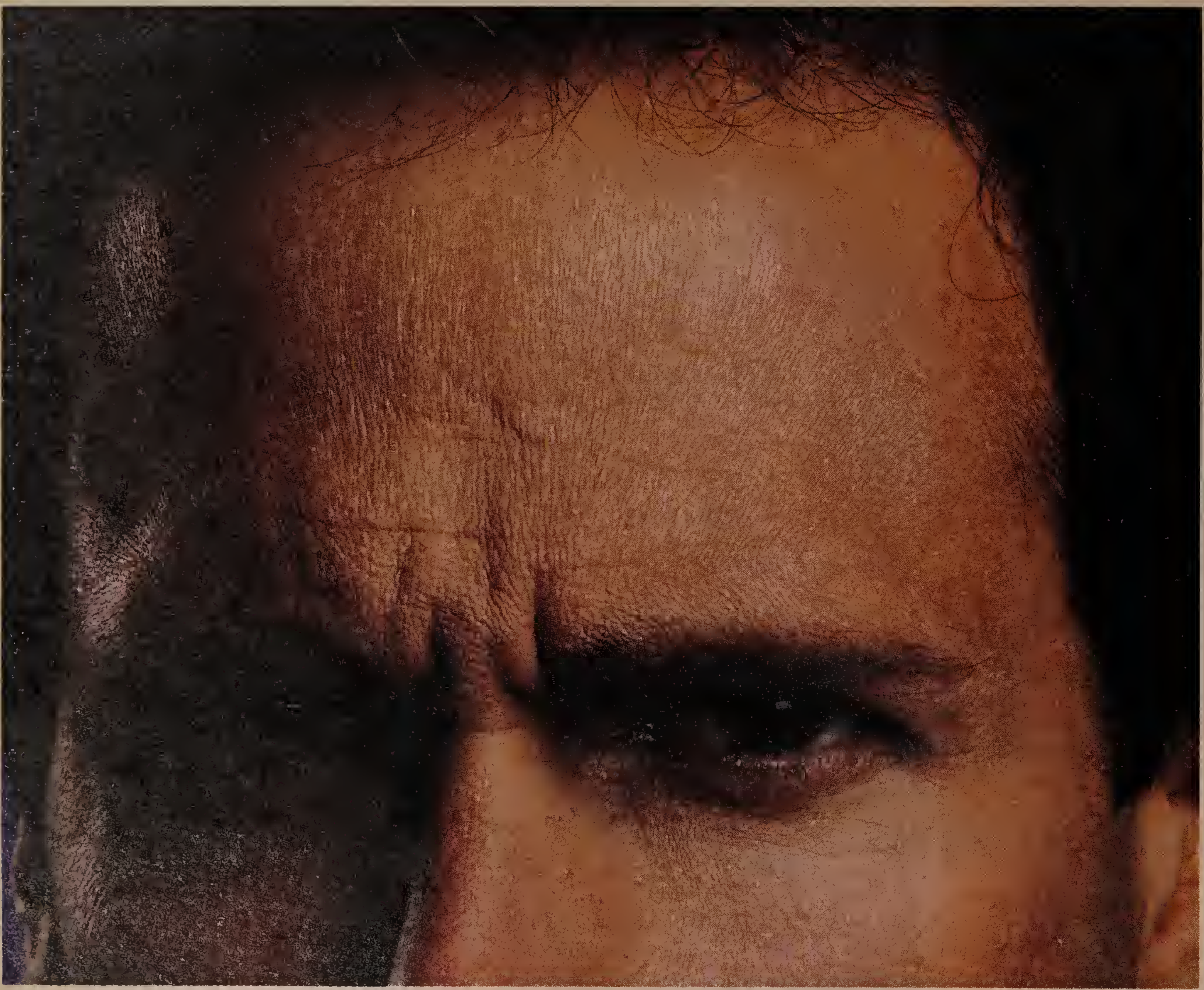
"Twisted-pair wiring and fiber-optic cable are our only alternatives," Wing claimed. He said using coaxial cable for these networks would be financially impractical as well as logistically difficult. There are already millions of miles of twisted-pair wire installed in process manufacturers' production facilities, Wing noted.

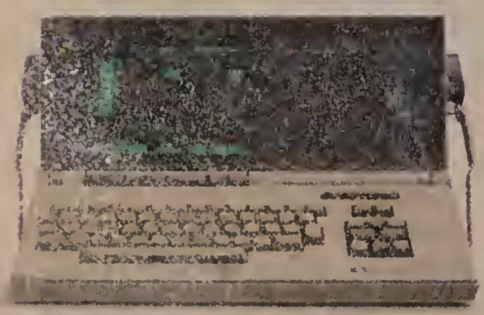
It has been difficult for the process industry to standardize a transmission medium because harsh factory environments require that the medium be immune to electromagnetic interference, moisture and high temperatures. The Instrument Society of America's SP 50 subgroup is currently grappling with the issue of what medium should be used for what are generally referred to as bit-bus or field-bus networks.

Procter & Gamble, a $16-billion consumer goods producer, has already implemented a MAP pilot test at its headquarters in Cincinnati. Veeneman noted that only the company's Hamilton, Ontario, manufacturing facility currently uses a broadband backbone local-area network. Broadband local nets are expected to be installed soon in two Procter & Gamble plants in Canada and another in the U.S.

If process manufacturers such as Procter & Gamble, Exxon Corp. and Weyerhauser Co. embrace MAP, smaller process manufacturers will undoubtedly follow suit. The addition of these process manufacturing leviathans to the MAP movement will dramatically broaden the scope of the automaker-dominated factory networking crusade.

Increased user interest in the factory communications standard will, in turn, increase vendor awareness of MAP. As more vendors begin to build MAP-compatible networking equipment, the price per connection to broadband nets should plummet. ◻





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HEWLETT PACKARD

MC15504

Incidentals from **page 17**

tory nets to accommodate MAP technology was placed on the back burner when General Motors Corp. divulged information on three of the Truck and Bus plants at the MAP/TOP users group meeting.

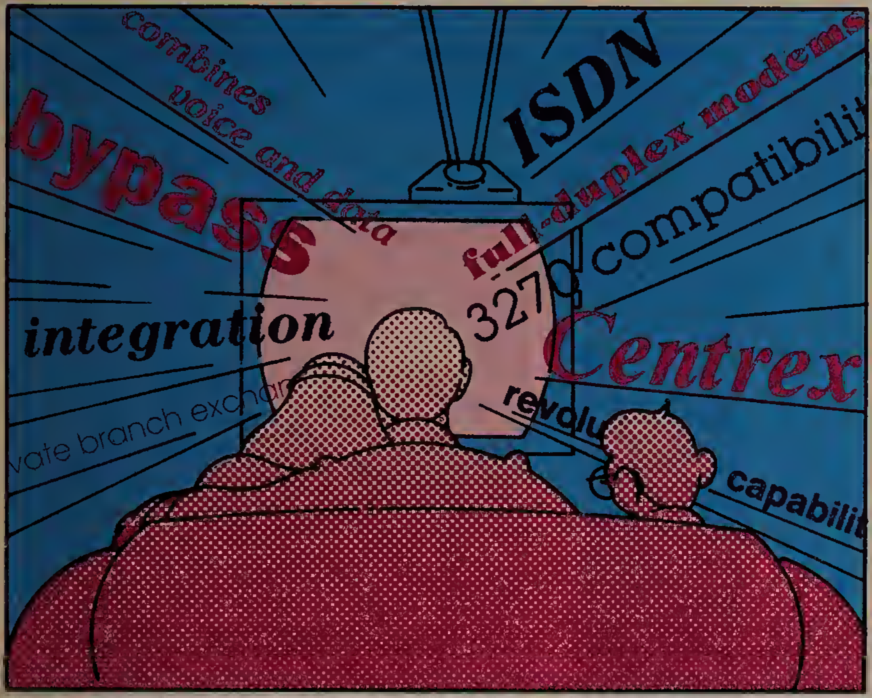
GM totally gutted two of the three mentioned plants, while a third was built to support a MAP system eventually. This was not the first time GM had ripped out the entrails of a factory. The automaker gutted the inside of a plant located in Dayton, Ohio, some time back. How many users can afford this practice? Not many. Something has to be done to address the need to adapt existing systems to MAP ◻

COMMUNICATIONS MANAGER

> “The vice-president will read an ad in a magazine that explains how one company has been local-area networking for years. He wants to know why we can’t do the same thing. In many cases, there isn’t even a product for sale we can use.
>
> **John Blevins**
> communications manager
> Hallmark Cards, Inc.
> Kansas City, Mo.

▶ USER VIEWS

Prime-time product hype leaves managers cold



BY MARGIE SEMILOF
Senior Writer

It’s not uncommon to see advertisements for sophisticated communications products and networking solutions in general interest magazines or during sporting events such as the Superbowl.

But how do communications managers — who are among the handful of people who understand the technologies being promoted — respond to that kind of media hype? The answer seems to be that they are decidedly unimpressed. In fact, some managers say such advertising can even make them leery of new product claims.

P.D. Christianson, assistant data communications manager of Middlesex Hospital in Middletown, Conn., said he enjoys reading product promotions to get a sense of what vendors are claiming their products can accomplish. But too many unfulfilled vendor promises have left him jaded by advertising.

“Reading ads helps me recognize names,” he said. “But equipment purchase is a long, drawn-out affair that involves a thorough request-for-proposal procedure.”

Some managers are willing to investigate new capabilities touted by product advertisements. But one communications manager for a giant Midwestern dairy said he questions whether a product will provide the networking cost savings often promised by the manufacturer.

“I have to explain to my boss how a local-area network will help me increase company profits,” he said.

“Ads don’t tell me how I am supposed to

See **Advertising** page 20

DIALOGUE

Are you currently preparing for the integrated services digital network or the International Standards Organization’s (ISO) Open Systems Interconnect (OSI) model?

“Having OSI would be a big help. We have 11 different computers with different operating systems and microprocessors. If we had OSI, I wouldn’t have as big a connectivity problem as the one I have now.

I doubt that the Corporation for Open Systems’ OSI efforts will beat efforts for ISDN. The ISO has said they would have specifications for all seven layers, but I haven’t seen anything yet.

Ron Bean
research supervisor
system support and distributed systems
Amoco Production Co.
Tulsa, Okla.

“Our philosophy is to control our own destiny, but we plan to be compatible with OSI and to accommodate SNA in the bottom three layers.

“Users must put pressure on vendors to implement standards in their products.

Terry Cox
senior technical advisor
mail service
Memphis, Tenn.

GUIDELINES

MARGIE SEMILOF

Beware garbled diction

Most managers shy away from voice recognition devices because the current generation of devices is hindered by limited vocabulary and requires the user to pause between each word.

But because future voice recognition products are being designed with managers in mind, not secretaries, vendors suggest that users prepare for upcoming voice recognition devices by boning up on their dictation skills.

Tony Amason, executive vice-president for the Lanier Thought Processing Division of Harris Corp., said users should practice enunciation to prepare for certain voice recognition devices, just as they practiced typing when personal computers appeared on their desks.

Amason observed that one of the biggest obstacles people must overcome is the natural human reluctance to speak into a machine. To operate currently available voice recognition devices, users are required not only to talk into the machine, but to speak in a clear, well-modulated voice and in an organized manner.

It may be another 10 years before people will be able to converse with a machine the way they converse with other humans. Vendors promise future voice recognition devices that will respond to an array of user speech characteristics, including devices that can be programmed to accommodate speech patterns with serious impediments.

However, to make the most of interim devices, Amason has provided managers with some practice steps to hone their verbal communications skills.

- Managers should organize their thoughts before speaking. Gather appropriate reference material and outline all points in sequence.
- Begin by identifying yourself.
- Spell out names and other technical terms to avoid mistakes.
- Be concise. Amason said users have a tendency to be conversational when using voice recognition devices. Pack as much information into as few words as possible.
- Indicate capitalization and punctuation. Mention paragraph breaks and quotations.
- Don’t shuffle papers, chew gum or smoke.

PEOPLE

Mahendra Patel was promoted to corporate consulting engineer of Digital Equipment Corp.

Robert Bressler has joined 3Com Corp. as vice-president and general manager of the Application Software Division.

Ken Jockers has been appointed general manager of Argo International Corp.

He has been serving as director of network planning for Argo since 1984.

Mac Lewis was appointed president and chief executive officer of Computer Network Technology Corp. He was most recently chairman of the board and senior vice-president of The System Center, Inc.

Paul Lazay was appointed vice-president of engineering at Telco Systems Fiber Optics Corp. He was most recently vice-president and director of engineering at ITT Corp.’s Electro-Optical Products Division.

Robert J. Carlson and **Dale. R. Olseth** have been elected to serve as directors of Lee Data Corp.

Carlson is currently chairman, president and chief executive officer of BMC Industries, Inc. Olseth is president of Darol Corp.

Advertising from **page 19**

tie the two issues together."

Managers say one benefit of generalized promotions for communications products is that they serve to educate the public about the communications industry and spark questions from senior management, who would otherwise have no interest in networking.

"I am willing to take an off-the-wall question from someone who doesn't understand the communications industry but [who] saw an ad in an airplane magazine, rather than see people remain totally ignorant of the issue," said one data communications manager.

However, the enlightenment of senior management occasionally backfires. Communications managers often get stuck explaining to upper managers why the company cannot use a product that promises to save millions in phone charges each year.

"The vice-president will read an ad in a magazine that explains how one company has been local-area networking for years," said John Blevins, communications manager for the Kansas City, Mo.-based Hallmark Cards, Inc.

"He wants to know why we can't do the same thing. In many cases, there isn't even a product for sale we can use."

According to Pam Valentine, manager of communications and advertising at 3Com Corp., most high-technology companies do not expect managers to make purchases based solely on the advertising they encounter in the general media.

Image enhancement

Valentine said most technical product advertisement in the general press is aimed at enhancing a company's image.

The company hopes broad exposure will produce a halo effect by making the public, senior management and managers with purchasing power more familiar with a company brand name.

"It's hard to say how many people understand the ads," Valentine said.

"But people are aware of many companies because they saw ads on television."

▶ ASSOCIATIONS

COS chief meets users

Lincoln Faurer, the newly appointed president of the Corporation for Open Systems, will address the Association of Data Communications Users (ADCU) at its annual conference on June 30 in Atlantic City, N.J.

The ADCU Conference is open to nonmembers and will be held at the Bally's Park Place Casino Hotel from June 30 through July 2. A conference brochure can be obtained by calling Auggie Blegen at (612) 881-6803 or by writing ADCU, P.O. Box 20163, Bloomington, Minn. 55420.

OPCOM, Inc. will hold its first D.I.A.L. users group meeting June 4, from 9 a.m. to 11 a.m. at the Hyatt Regency Atlanta, in conjunction with the International Communications Association show.

The group will be addressed by D.I.A.L. system users, Gerry LeBlanc of Shell Oil, Don Pederson of 3M Corp., John Frantonius of A.C. Nielson Co. and Doug Fields of Key Bank Services, Inc.

For more information, contact Ellen Pensky at (408) 749-1911, ext. 440.

Notes from the Racal-Milgo User Group meeting:

Approximately 75 members of the Racal-Milgo User Group met recently to discuss vendor products, digital technology and a host of management issues facing communications professionals.

- Users reported replacing analog 9.6K bit/sec lines with digital services to stave off analog line costs. One user claimed he had no digital circuits in his network last year. This year he has added 12 56K bit/sec lines. The implementation eliminated the need to buy approximately 120 modems.
- Racal-Milgo officials quenched user fears that the company would eliminate support for its network management tool CMS in the wake of the expected release of a new network management product called Sunrise. One Racal-Milgo official explained that CMS support may diminish after a while, but the change in technology would benefit all users.
- A group of Racal-Milgo users are interested in creating an emergency modem pool. Users would share the cost of the hot site and would be guaranteed a replacement product in case of a major network failure.
- The group's new president is Ken Tigges, supervisor of network planning of Carolina Power & Light Co., Raleigh, N.C.

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NEW PRODUCTS AND SERVICES

See inside for:
- ▶PC Expansion board
- ▶2,400 bit/sec modem
- ▶Voice recognition mail system

▶ INFOTRON SYSTEMS

Control tool debuts

Offers integrated net management.

BY PAUL KORZENIOWSKI
Senior Writer

CHERRY HILL, N.J. — Infotron Systems Corp. became the newest member in a growing line of vendors attempting to integrate network management and control systems so they can be accessed through one console.

Integrated Network Management (INM) works with the company's 1500 T-1 multiplexer and 990 or 992 multiplexers. The package is based on an Apollo Computer, Inc. Domain superminicomputer and supplies central system management of network lines.

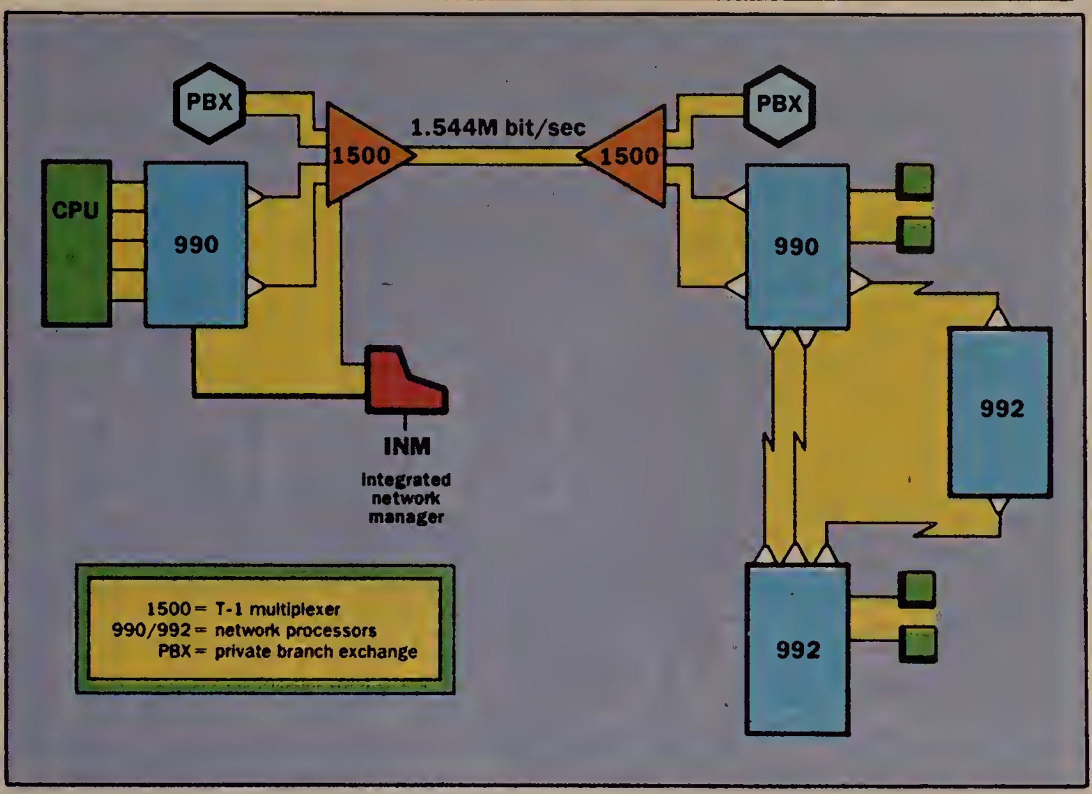
The product detects line problems from thresholds set by a user. Thresholds can be set for link failures, line degradation and traffic congestion. In addition, INM will alert a network manager whenever a power supply or an individual device fails.

With the network management tool, an operator is able to isolate faults and restore network connections automatically. From a central console, an operator can change, delete or add nodes running on an Infotron network.

INM supplies a menu-driven interface, icons and a mouse to help users determine network problems. The product supports windows so that an operator can examine different pieces of a network. Information in a window is automatically updated whenever an operator makes a change.

The product's first screen supplies a map of the U.S., which can be used to monitor line performance. Green lights indicate that a line is functioning properly, yellow illustrates a possible alarm condition and red means that a connec-

See **Infotron** page 23



Application of Infotron's integrated network manager

PBX
1500
1.544M bit/sec
1500
PBX
CPU
990
990
992
INM
Integrated network manager
992
1500 = T-1 multiplexer
990/992 = network processors
PBX = private branch exchange

▶ ICA PRODUCT DEBUTS

Fiber-optic quintet to bow at show

Racal-Milgo to unveil T-1 multiplexers, modems for building and campus environments.

ATLANTA — Racal-Milgo, Inc., a division of Racal Electronics, Plc., said it will introduce five fiber-optic products at the International Computer Association exhibition that begins here today. Designed for building and campus environments, the offerings include a multiplexer and modem operating at speeds of 1.54M bit/sec, as well as two multiplexers and a modem operating at speeds of 19.2K bit/sec.

The company said its Fibermode 1100 T-1 modem converts digital signals to fiber-based signals in order to connect central processing units, multiplexers, private branch exchanges and other devices within private networks at distances up to 1.8 miles. The device transmits data at speeds up to 1.54M bit/sec.

The Omnimux 1400 T-1 multiplexer can support two or four channels on one or more T-1 digital lines. Fiber optics supports local distances of up to 1.8 miles, according to the firm. Each of the device's input channels reportedly can be configured to support T-1 speeds of 1.54M bit/sec or the CCITT speed of 2.048M bit/sec.

The Fibermode 6100 modem has been designed for asynchronous data transmission. The device operates in full-duplex mode at speeds

See **Racal** page 23

▶ EQUATORIAL

Two-way Vsat unit launched

Provides medium-speed transmission.

BY MARY PETROSKY
West Coast Correspondent

MOUNTAIN VIEW, Calif. — Equatorial Communications Co. last week introduced a medium-speed, two-way very small aperture terminal (Vsat), dubbed the C-250. The terminal is designed for Vsat network users whose applications involve transmitting large bursts of data and require fast response time.

The C-250 is reportedly capable of sending data at up to 9.6K bit/sec, compared with the existing C-201, formerly called the C-200, which has a 1,200 bit/sec rating. Both Vsats receive at speeds up to 19.2K bit/sec. Geographically dispersed Vsats allow users to send information to a remote data center via satellite. Data beamed off the satellite from a hub station can be received by the Vsats.

> *"Both Vsats receive at speeds of 19.2K bit/sec."*

In addition, Equatorial announced several enhancements to its Equastar private data network, including improvements and new equipment valued at $10 million for its hub station here. These enhancements will allow the hub station to support an additional 20,000 two-way micro earth stations by 1988.

Equastar is a private, packet-switched data communications network based on satellites. The network is aimed at large companies looking for an alternative to leased telephone lines for sending and receiving data between a central computer and hundreds of remote Vsats. The network is geared to inquiry-response and data-collection applications, such as financial transactions, process-control monitoring, retail point-of-sale and

See **Equatorial** page 23

PRODUCTS & SERVICES

Telephone-wired Personal Computer local network

David Systems, Inc. introduced an expansion board that enables IBM Personal Computers to be connected to a 3Com Corp. local-area network via telephone wiring.

The **Integrated Personal Computer Adapter (IPA)** takes the place of an Ethernet transceiver, coaxial cable and 3Com board needed to connect to an Ethernet local-area network. Workstations or other Ethernet-compatible devices connected to a David local-area network can be located up to 2,000 feet from the David Manager, a hub of the star-configured network.

The David Manager supports 192 devices with a 10M bit/sec internal bus. The IPA supports concurrent voice/data transmission when a telephone set is connected to the IPA through a built-in analog adapter using an RJ-11 plug.

Supported by 3Com Etherseries and 3Com 3Plus software releases, the IPA is the first product to come out of a software licensing agreement between David Systems and 3Com Corp. and will cost $595 when made available in August.

David Systems, Inc., 701 E. Evelyn Ave., Sunnyvale, Calif. 94086. (408) 720-8000.

2,400 bit/sec modem

Anderson Jacobson, Inc. has announced a 2,400 bit/sec modem for the IBM Personal Computer line.

The **AJ 2412-AD3H** operates at speeds from 300 to 2,400 bit/sec and supports asynchronous and synchronous transmission. The modem features programmable software options, an extended Personal Computer AT command set, memory dialer and security features. The menu-driven automatic dialer stores up to 25 43-digit telephone numbers in nonvolatile memory.

Security features include two levels of password security to protect the number directory; modem configuration; and functions such as dialing numbers, storing numbers and setting options.

AJ 2412-AD3H sells for $599.

Anderson Jacobson, Inc., 521 Charcot Ave., San Jose, Calif. 95131 (408) 435-8520.

Voice mail system

Votan Co., a Freemont, Calif.-based voice recognition system manufacturer, is expected to announce a voice mail system based on voice recognition at the International Communications Association show in Atlanta this week.

The **Telecenter** voice mail system is reportedly the first to use voice recognition as a system operator. Users are prompted to enter system commands by speaking one of approximately 25 reserved words to access such system functions as message recording, message playback, message forwarding or distribution of voice memos to any of up to 10 predefined lists of other users on the system. A computer-generated voice operator asks users to repeat unclear words or will accept commands entered through telephone keypads.

The system supports four phone lines connected to an IBM Personal Computer XT model equipped with Votan voice cards and Telecenter software. The Telecenter system will give support to up to 400 predefined users with secured voice mailboxes. The system can be configured to stand alone or interface with a private branch exchange.

Using voice compression techniques developed by Votan, up to 7½ hours of messages can be stored on a 30M-byte disk, up to 15 hours can be stored on a 60M-byte disk.

Telecenter costs $40 per user.

Votan Co., 4487 Technology Drive, Fremont, Calif. 94538 (415) 490-7600.

Terminal emulation software

Tymnet/McDonnell Douglas Network Systems, Inc. is expected to introduce IBM 3270 series terminal emulation software — software that allows IBM Personal Computers to use its Async-to-3270 protocol conversion service — at the International Communications Association show in Atlanta this week.

The **Smartym 3270** package, developed by **Persoft, Inc.**, uses Tymnet's Async-to-3270 service and enables an IBM Personal Computer to access an IBM 3720. The Smartym 3270 package supports the error-correcting X.PC asynchronous communications protocol and allows 3270 host screens displayed on the personal computer to be stored on a floppy disk.

The Smartym 3270 costs $175.

Tymnet/McDonnell Douglas Network Systems, Inc., 2710 Orchard Pkwy., San Jose, Calif. 95134 (408) 946-4900.

All
T1 networks
save you money
when
they're *up.*

Equatorial from **page 21**

branch office administration.

Equatorial also announced it has built a standby hub station in Brooklyn, N.Y., to provide emergency network restoration services. Users can order this service now for $30 per month per supported earth station, although initial implementation of the service will take four to six months, according to Ed Parker, the company's co-founder and vice-president of network development.

Parker emphasized that the California hub station is a reliable, redundant facility and that the New York backup station is only for users with the most critical applications. The New York facility will also act as a concentrator for message traffic in the eastern U.S.

The company also said it has opened new regional field support offices in Atlanta, Chicago, Dallas, Denver and Newark, N.J. In addition to the regional offices, Equatorial has 61 field service locations throughout the country.

Low-speed Equastar is aimed at a different market than higher speed satellite-based networks, such as AT&T Communications, Inc.'s Skynet Star Network service, Parker said. "We believe there's a billion-dollar market for low-speed, voice-grade leased lines that are being used for data," he said. "That's our business — getting customers to replace those lines [with Equastar]."

Because Equastar is aimed at low-speed data applications, Parker expects the $6,000 C-201 earth station to dominate users' networks, while the $8,000 C-250 will be used at specific sites where data traffic calls for its higher speed. Equastar can save users approximately 30% of the cost of leased lines, Parker said.

Although other vendors could offer slow-speed services, their use of Ku-band technology means they would have to charge more than Equatorial, he said. Equatorial uses C-band technology. C-band satellite earth stations operate at between 4 and 6 GHz. Parker added that Ku-band earth stations operate at between 12 and 14 GHz, requiring more power to drive the signal, thus driving up operating costs.

> *"Equastar can save users approximately 30%."*

Racal from **page 21**

up to 19.2K bit/sec over distances of up to 2,600 feet. The unit is a plug-compatible replacement for most four- and nine-wire twisted-pair cables, short-haul line drivers and asynchronous modems.

Also being released by the company are the Omnimux 8100 and Omnimux 8600 multiplexers designed for minicomputer and mainframe environments. The company said the devices can operate in asynchronous or synchronous mode over distances of up to 1.8 miles at speeds up to 19.2K bit/sec.

The Omnimux 8100 supports eight channels and is expandable to 16. The Omnimux 8600 supports 16 or 32 channels, expandable to 64.

The products share common diagnostic traits such as a front panel display and alarm for local and remote loopback testing. Other diagnostics indicate a loss of frame synchronization, a loss of signal and a loss of receive signal.

The Omnimux line ranges in price from $1,200 to $3,080, depending on the number of channels supported and optional cabling or optical capability for extended distances. The modems range in price from $176 to $1,200 each.

Infotron from **page 21**

tion has been severed.

INM will illustrate individual channel configurations, the status of each channel and the status of each link connected to a 1500 T-1 multiplexer.

The network management package includes a data base that stores traffic statistics, trend analysis information and event logs. A user can produce a number of reports, including those for traffic utilization, average and peak loading and statistical summaries. A user can test various circuits by running control signal status, round trip delay and nondisruptive tests.

For security, a password system can be used to prevent unauthorized users from gaining access to the system.

Infotron plans to include support for additional pieces of its equipment, including the company's T-1 hub facilities. Once the company has included support for all of its products, other vendors' wares will be added. A prime candidate for the integration is Codex Corp.'s network management packages.

The price for INM ranges from $80,000 to $100,000. Beta shipments are scheduled to begin in July, and the product should be generally available in September.

Let's talk about the cost of being *down.*

A typical T1 network can save you $5000 per *day* when it is up. And cost you $5000 a *minute* when it is down.

Because when your network is down, your critical applications are simply not available. You pay through lost business. Lost productivity. Lost information.

Here's why the IDNX® transmission resource manager from Network Equipment Technologies® keeps your critical applications available *more:*

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(You can't have too much.)

Redundancy of all the vital components in every IDNX node. Even more important, the *intelligence* in the system provided by over 25 man-years of software to self-heal rapidly, at the node level and on the network level, with minimal downtime, and without operator intervention.

Such redundancy *must* be a fundamental architectural feature of the network system; it cannot be bolted on afterward any more than you can wire spare wings onto a jetliner. Please don't let any vendor convince you otherwise.

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Here's what puts N.E.T. customers ahead:

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Second: *Compatibility.* With existing communications standards. With the emerging ISDN standards. And with all major T1 common carriers. Again, compare.

Third: Unequalled *reliability.* Our technology, through designed-in, non-stop redundancy and an intelligent, self-healing network architecture means our customers' critical applications have *higher availability*—the true measure of reliability. We invite comparison.

Fourth: Our *service.* Beyond maintenance, a system that can be diagnosed quickly, from your offices or our 24-hour-a-day, seven-day-a-week Technical Assistance Center. Down to the board level on any network node. Service that extends to network design and planning. Service that makes the task of building a private corporate network *practical.* Compare.

Finally: Our *proven* success. With installations all over the U.S., we have solved the thorny problems that are still merely on paper at most of our competitors. By all means, compare.

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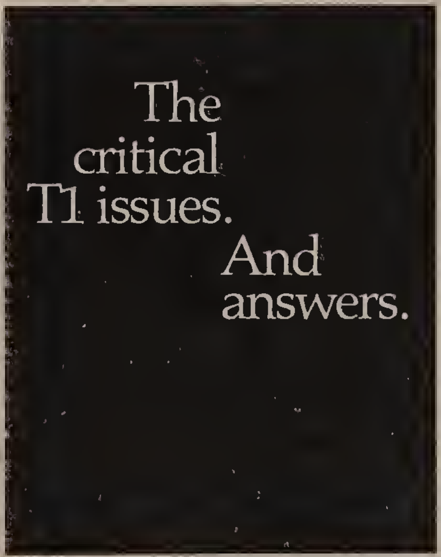
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RESEARCH

ALAN CHYNOWETH

Lightwave technology

Conceived a quarter century ago, the first lasers emerged from massive banks of capacitors that discharged into coiled photoflash lamps. Those lamps pumped the ruby rods that produced early laser beams.

> *“Today, lightwave technology is, as gamblers say, on a roll.”*

The first lasers were tremendously exciting and important because they stirred the imagination, although they were hardly convincing forerunners of practical communications devices. They kindled visions of optical communications systems with information-carrying capacities far greater than even the highest frequency radio and microwave systems then in existence.

Scientists and engineers around the world turned their attention to converting this vision into reality. They sensed in lightwave technology the possibility of making great steps forward in meeting the demand for greater transmission capacity, new telecommunications services and lower costs. It was an irresistible temptation.

Today, lightwave technology is, as gamblers say, on a roll. Hardly a lightwave conference goes by without disclosure of spectacular accomplishments in the field, such as the increased information carrying capacity of optical systems. As these advances are made, the cost of a standard communications channel comes down accordingly. Indeed, lightwave technology is doing for signal transmission and distribution costs what the well-established silicon chip technology has done for signal processing and switching costs. Together, these two technologies are bringing the costs of communications systems, capabilities and services ever downward.

As the costs decrease and more applications are found for this information-age technology, the market base widens. Users know a good thing when they see it, and lightwave technology sales are increasing dramatically. The amount of channel capacity being installed in the U.S. each year exceeds that of the total Bell System toll network in 1980. What makes this penetration all the more remarkable is that, less than a decade ago, some industry observers said they did not foresee much need for lightwave systems in the telecommunications network through the 1980s. Clearly, the lightwave business is so vigorous that further advancements seem inevitable. But we are in danger of being blinded by the current technological and business successes, which tend to obscure some of the difficulties that had to be overcome and that might breed overconfidence about the future.

> *“Users know a good thing, and lightwave technology sales are increasing dramatically.”*

The first hurdles were in finding ways to achieve the technical objectives that would give photonics technology a chance of being practically applied. Ways had to be found to make fibers with sufficiently low loss and lasers that were sufficiently longlasting. After a series of seemingly lucky breakthroughs, network research engineers reached the point where they

Chynoweth is vice-president of applied research at Bell Communications Research Corp. in Livingston, N.J.

LOCAL-AREA NETS

MICHAEL DURR

Uncorking the bottlenecks

Performance degradation is a common, almost inevitable problem with local-area networks.

The local net is installed for a certain number of workstations and a predicted amount of traffic. But as the network gains acceptance, more workstations and applications are added. Soon, performance begins to decline and the site manager is looking for a remedy. With a local-area network, performance improvement can often be achieved with a relatively low-cost addition to the system. The first problem, however, is to identify the bottleneck.

A local-area network is a staged system. Requests are issued at the personal computer workstation, enter the network interface card (NIC), go through the cable, enter the server's NIC, are processed by the server and are sent to the disk subsystem. Replies then make the same step-by-step journey back to the workstation.

Each process and transfer stage in the system is a potential impasse; a place where overall system throughput is reduced. On a local net, the system throughput will be no faster than the slowest component of the system. Unfortunately, components aren't rated in a way that allows precise mathematical isolation of a hardware crunch.

Experience and logic, coupled with an understanding of how various components perform, are the best tools available for finding trouble spots.

Applications software and local-area network software and hardware are all capable of causing poor performance. However, if a network were providing satisfactory performance and then degraded as the load increased, the problem would probably be in the local-area net hardware or software. For now, let's concentrate on the hardware.

To narrow the search further, hardware can be arranged in four categories: workstation, server, disk subsystem and the NIC and cable combination.

A local net workstation is normally one of the many varieties of intelligent personal computers.

> *“Unfortunately, components aren't rated to allow precise mathematical isolation of a hardware crunch. Experience and logic are the best tools available for finding trouble spots.”*

A lower performance personal computer is capable of using less of the total system throughput than a higher performance model.

If the system throughput is not being fully utilized, then upgrading from an IBM Personal Computer to an IBM Personal Computer AT, for example, will improve throughput at a particular workstation — perhaps as much as 20% to 70%.

However, when a network has begun to degrade in performance, that suggests that performance will not be improved by changing workstations. The problem is that too little total throughput is available on the network and the system is overloaded. We're looking for a solution that will raise the total throughput.

Changing servers is one possible way to raise the total system throughput. A faster server is indicated by a wider processing and data path bandwidth, a higher clock cycle speed (expressed in MHz) and a lower number of wait states.

Usually when a new server is installed, the old server can become a workstation, thus preserving the hardware's useful life.

The disk channel, the third category, is often the culprit when a local network's performance degrades.

A disk channel normally has a maximum throughput of 160K byte/sec for reads and 100K byte/sec for writes. Suppose that the desired performance on a network is an approximation of the performance of a local Personal Computer XT hard disk. That's 58K-byte/sec throughput or about half the throughput of a disk channel.

See **Performance** page 26

Durr is public relations manager for Novell, Inc. in Orem, Utah.

had to begin to take photonics seriously. After all, it might just offer an alternative to copper.

Once network engineers started looking at optical fiber not as a high-cost substitute for copper but as a low-cost-per-channel transmission medium in its own right, lightwave was on its way.

> *“In the Bell System, the transition began under a few city streets.”*

In the former Bell System, the transition began under a few city streets, where the underground ducts carried interoffice trunks. This was a humble, almost apologetic application for lightwave compared with what the visionaries had in mind. But it sufficed for starters.

For interoffice trunks, local subscriber loop carriers and long-haul trunks alike, lightwave is proving in as the transmission medium of choice.

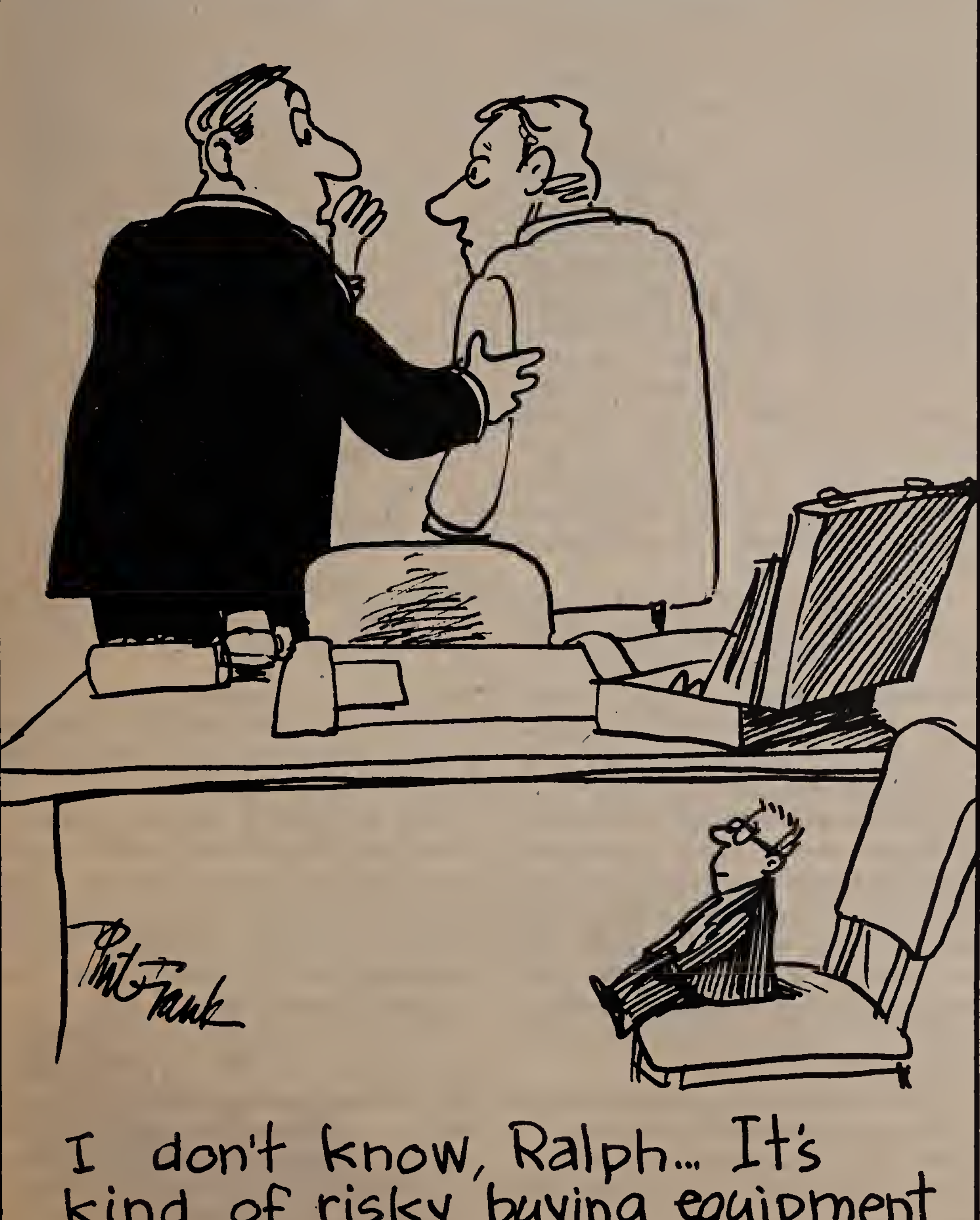
It is proving in because of its lower costs — not only in material costs on a per-channel basis, but in lower maintenance costs as well. The long repeater spans drastically reduce the amount of electronics that must be maintained in outside environments. Copper has succumbed almost completely in new toll and loop feeder networks.

Attention is increasingly focusing on the final local loop distribution and on on-premises systems. Researchers at Bell Communications Research Corp. have demonstrated that single-mode fiber in the local loop is feasible today using light-emitting diodes as an interim step until a cost-efficient laser is produced for the local short-haul distance.

All this spectacular new network technology comes at a time when the telecommunications networks are becoming less regulated and more open to competition. Driven by competition, the race is on to get as much capability into the networks as possible. In an effort to anticipate subscribers' growing needs for the wideband services that lightwave can make economically feasible, the Bell op-

See **Lightwave** page 26

▶TELETOONS — By Phil Frank



I don't know, Ralph... It's kind of risky buying equipment from a small vendor.

MODERN MANAGEMENT

WALTER ULRICH

Drug testing: only as a last resort

Drug use is a serious problem in our society today. Corporate America pays a multibillion dollar price for drug and alcohol abuse. The problem manifests itself in absenteeism, lower productivity, impaired decision making, accidents and theft.

Many people are calling for mandatory drug testing of communications employees. This entails requiring employees to submit to regular urine tests. Urinalysis would be part of the pre-employment physical. Random testing would be conducted on all employees. Many people consider such testing to be unprofessional and degrading.

> *“Civil libertarians say mandatory testing is a violation of privacy.”*

Civil libertarians complain that mandatory testing is a violation of individual privacy. Guilt is assumed, and individuals must prove their innocence by taking the test. They are appalled at a notion that controverts the premise that all individuals should be presumed innocent until proven guilty. What can be done to resolve this moral and legal dilemma?

Corporations have a right to establish performance standards and demand results from their employees. But in general, people's private lives are their own business. So long as performance on the job is not impaired, their off-duty activities should be beyond the jurisdiction of employers.

Whenever performance on the job slips, management should be concerned. Corporations have a wide range of options for dealing with substandard performance. When there is reasonable cause to suspect chemical abuse, drug testing may be necessary as part of a rehabilitation program.

Some jobs entail such special circumstances that routine drug testing may be more easily rationalized. Examples might include air traffic controllers, pilots, police narcotics officers, surgeons, judges and individuals with access to national security secrets.

It would be unconstitutional for the government to establish mandatory drug testing for everyone. Any steps in this direction on the part of federal, state or local governments should make us all uneasy. On the other hand, the government should not intrude further on the establishment of contracts between employees and employers. Government regulations forbidding drug testing would also be unacceptable.

The terms of employment should be negotiated by the parties themselves. Modern companies are sure to weigh the privacy rights of their employees heavily in the hiring process.

It's hard to imagine George Washington, Thomas Jefferson or Alexander Hamilton submitting to urine tests. Some people who would make excellent employees and strong leaders would refuse to take such a test on principle.

Companies must balance fairness and decency with economic and job safety factors. Mandatory drug testing is a negative bureaucratic solution that is demeaning. In a free society, companies should be able to find more palatable solutions. Drug testing should be used only in the highest risk areas, and then only as a last resort.

> *“It's hard to imagine George Washington submitting to a urine test.”*

Ulrich is president of Walter E. Ulrich Consulting, Inc. in Houston.

OPINIONS

Lightwave from **page 25**

erating companies are going after installing these services right up to the subscribers' premises.

We are at a watershed in the lightwave saga. So far, the business has been largely technology-driven, and the beneficial effects have largely been the cost reduction in existing types of transmission and distribution equipment and services.

Corporate philosophies and policies were the principal pacing factors. Technology went in search of markets. In dynamic contrast, the future growth of the lightwave business will more and more be determined by society's need for abundant bandwidth. In other words, the market will determine how much of the new technology it will need.

One need that stands out in this coming age of electronic libraries and other information bases is the ability to browse or scan in much the same way a person skims a book or scans a newspaper. Flipping electronic pages will require video-like bandwidths that support a scanning functionality equivalent to the fast-forward on a videocassette machine. The day will eventually come when face-to-face communications will routinely take place over a distance as if the parties were in the same room. And will we, one day, view three-dimensional holographic images of each other, as in today's science fiction?

> *“We are at a watershed in the lightwave saga.”*

All this will require, of course, that lightwave technologies keep advancing rapidly in order for service costs to be acceptable. It will also require breakthroughs in wideband switches, perhaps advanced versions of photonic switches.

One objective must be to make the transport of video programs over the network economically competitive with renting videotapes and transporting them home from the supermarket in the car. Formidable competition. Indeed, it has been observed that, not only in the video context, but in the area of large data bases and software programs, far more information transport occurs in tapes via airplane or taxi than by downloading over the network. Clearly, network developers have considerable opportunities available to them.

There must be a steady dialogue between the technologists and the public. Technological advance will continue; it is the dynamo of societal change. But the manner in which technology advances must, in turn, constantly adapt to the changes in the societal environment that it does so much to bring about. ◼

Performance from **page 24**

If a given application executes disk I/O 20% of the time, then 10 workstations could use up the disk channel's throughput. If the I/O took place at the same time, two stations would use up the channel.

As a rule of thumb, if the red light on the hard disk is flashing most of the time, that's an indication of a disk channel problem.

The best strategy for overcoming a disk channel bottleneck is to add another channel or another disk subsystem complete with controller, cable and disk.

This will open up the disk channel bandwidth, provided that the disk I/O is evenly balanced between the two channels.

The fourth hardware category is the NIC and cable combination. The most likely bottleneck in this category is the raw bit rate. The raw bit rate is the so-called cable speed of the local-area network.

This is the speed of a message unit over a clear length of cable and is usually in the 1M-bit/sec to 10M-bit/sec range for local nets. Actual throughput is never 100% of the raw bit rate because of the other performance factors. And raw bit rate is a very poor characteristic to use in estimating the potential performance of various networks.

On the other hand, a low raw bit rate might result in a cable bottleneck. A 1M-bit/sec network might get a high 80% of the raw bit rate as throughput.

But that's only .8M bit/sec or 100K byte/sec throughput. That's the same throughput as the disk channel, and the disk channel calculations described earlier apply here as well.

Cable throughput needs should be carefully projected before a local-area net is selected. However, if a cable bottleneck does occur, there are two remedies.

> *“Cable throughput needs should be projected before a net is selected.”*

One solution is to split the network physically and connect the two segments with a bridge. The two networks still form a single virtual network, but now fewer workstations are dividing up the available throughput.

The other solution is the painful and expensive one of replacing the NIC and cable combination. In summary, performance degradation will be a problem at most local network sites as the net grows and is used more. While a decrease in efficiency is virtually inevitable, it is also easily curable through identification and elimination of the slow process and transfer points — those system bottlenecks. ◼

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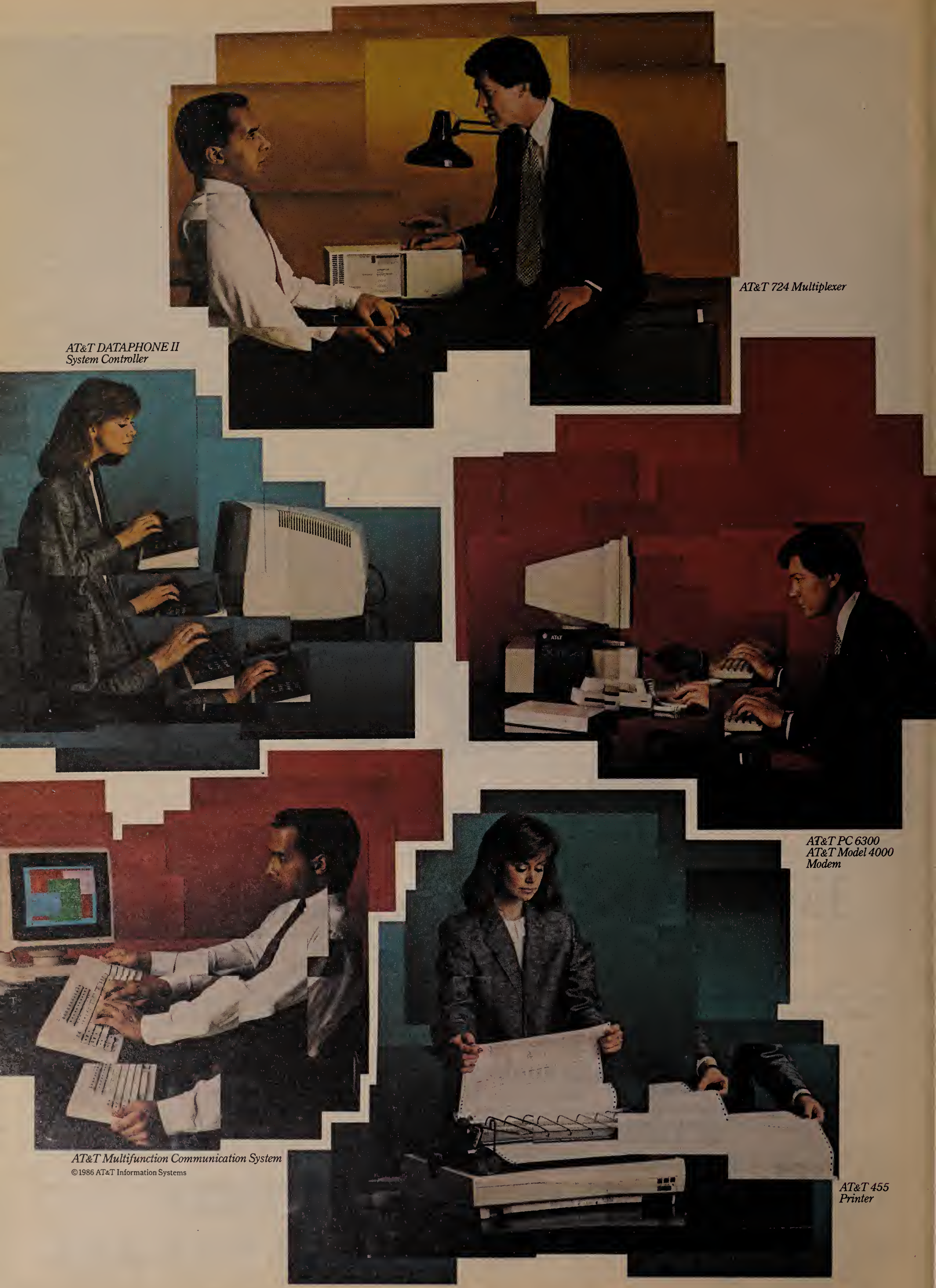
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NETWORK WORLD

Features

June 2, 1986

The telecom van that Mazda built
Have you ever wished that your company-supplied vehicle was equipped with state-of-the-art telecommunications equipment that would keep you in touch with the home office no matter how far afield you ventured? Mazda's prototype Telecom Delivery van not only fills that bill, but keeps its driver from getting lost through a satellite-based positioning system and an on-line library of road maps.
This page.

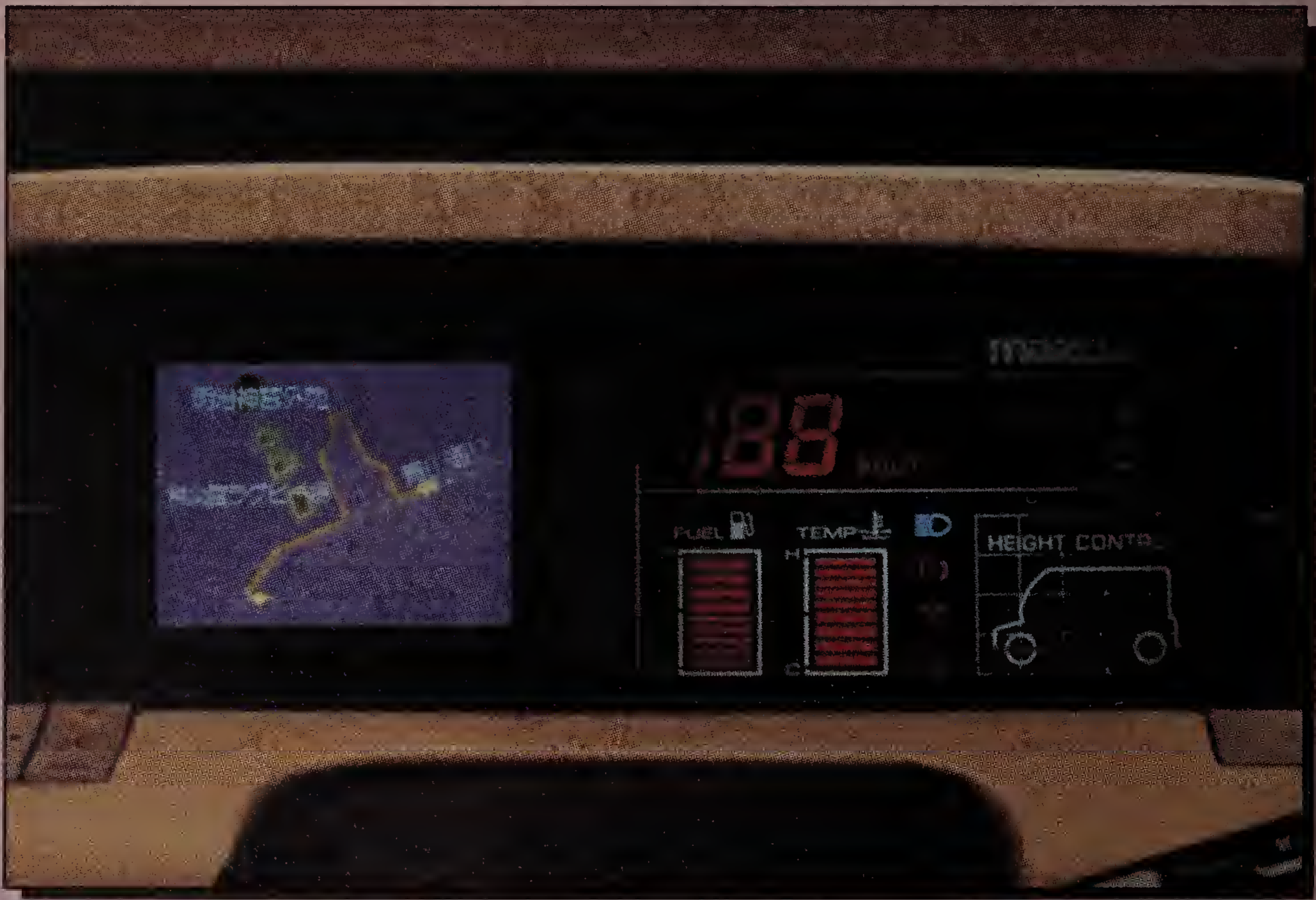
ICA's Chester Bellaires
After 40 years in the network business, Chester Bellaires of Capital Cities ABC, Inc. says that communications managers today face more challenges than ever because of changing technologies and responsibilities. As the likely successor to the ICA presidency, Bellaires hopes these increasing obligations won't deplete the organization of its valuable volunteers.
Page 1.

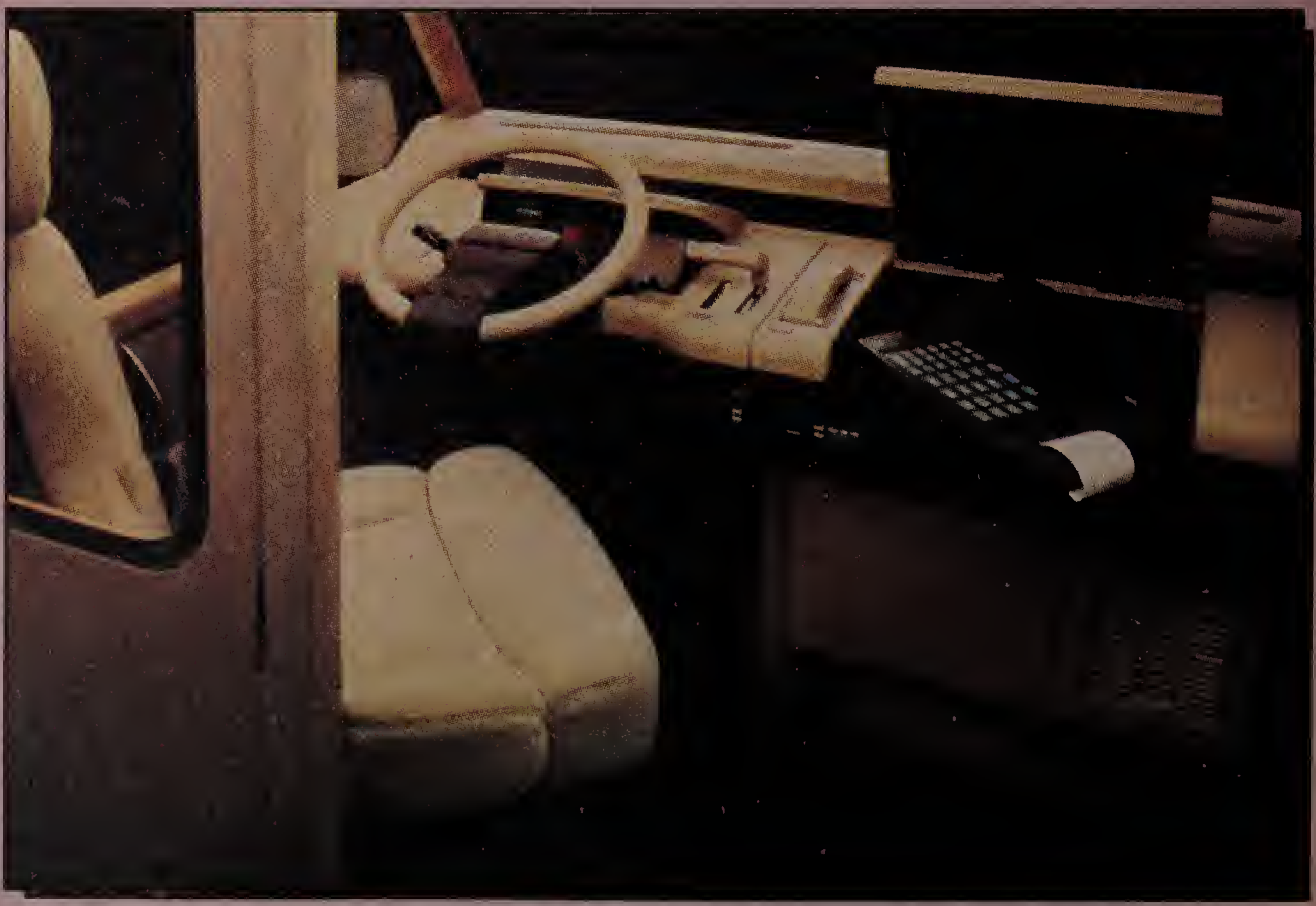
Value-added networks in the vanguard
Plain vanilla value-added networks are expanding into an assortment of applications and services. Communications users can take advantage of innovative options and pricing policies while network vendors wrangle for market share.
Page 37.

Expert advice
Sorting out the players in the burgeoning value-added network services market can be a lengthy chore for communications managers. Here's a compendium of user advice from eight veteran net watchers.
Page 41.

MOBILE COMMUNICATIONS

The telecom van that Mazda built





For the first time, a major automobile maker incorporates telecommunications as the primary marketing concept for a new vehicle.

BY JOE TROISE
Special to Network World

Automobiles and computers are no strangers to each other, even though it took 10 years or so to engineer a workable truce between the once incompatible environments of robust internal combustion and delicate microchip circuitry.

The Mazda Motor Co. has recently taken this fledgling alliance one step further by introducing the computer and its attendant systems as a primary marketing concept. For the first time, an automaker is touting the performance of the electronics — in this case, telecommunications equipment — over the performance of the vehicle itself.

The basis for this new marketing angle is the Mazda Telecom Delivery, a handsome and compact one-and-a-quarter-box van first introduced in a fully functional form late last year at the Tokyo Motor Show. The prototype van has yet to be displayed at a U.S. auto show.

While designed primarily as a vehicle that applies telecommunicating capability to the distribution of small goods, this van's potential as a mobile telecommunications center should not be overlooked.

The Mazda Telecom features the Mobile Source Commu-

☞ Continued on **page 33**

Troise is a free-lance writer based on a houseboat in Sausalito, Calif.

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When articles from the other communications weekly were reviewed by the same communications users, the ratings didn't come close. Nearly half of the users felt that these articles were directed toward someone else or were unsure where they were directed. That's no surprise. The other publication was designed to serve vendors.

It's clear that communications users can tell that *Network World* is different. We'd like to prove it to you, too. Just call Doug DeCarlo, Publisher, at (617) 879-0700 for a complete presentation.

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CW COMMUNICATIONS

From **page 31**

nications System, a collaboration of Sumitomo Electric Industries and Pioneer Electronics. Major components include a telephone and a full-function computer terminal that can transmit data to a home office minicomputer or mainframe through a multichannel access network, which is the Japanese counterpart of a regular cellular telephone network.

Also on board is a navigation system utilizing the National Aeronautics and Space Administration's Global Piloting System satellites, with road map information stored in the van on a Pioneer compact disk read-only memory (CD-ROM). The compact optical disk is of large capacity — with 30,000 maps per disk — and provides a short access time.

A radio signal from the Global Piloting System satellite is used to select the required map, which is then displayed on the six-inch CRT in the vehicle instrument panel. Once the driver enters the code for his destination, the system shows the best route on the map and can also provide up-to-date traffic information sent by the home office.

The map can be enlarged or reduced in size. When major intersections are approached, the driver can zoom in on an in-perspective, three-dimensional drawing of the intersection. Other system components include a printer that can print out receipts, invoices, messages from the main office and any other paperwork required during the delivery process.

An additional interesting feature is a hand-held portable computer that the driver can use either as a bar-code reader or as a terminal for storing information gathered while outside the vehicle. Upon returning to the van, the driver can plug data into the vehicle's on-board terminal, which in turn can transmit this information to the home office.

The Mazda Telecom Delivery van also employs computer circuitry in a number of functions not related to telecommunications. A computer-controlled solar ventilation system keeps the van cool inside. Another convenience is the loading door's ability to open automatically when activated by a remote signal from the driver's hand-held computer.

In keeping with the innovative nature of the Telecom Delivery's electronic systems, the mechanical specifications of the vehicle are also state-of-the-automotive-art. A compact and efficient transversely mounted 2-liter diesel engine, sitting at the extreme front of the van, is coupled to an automatic transaxle driving the front wheels. This arrangement allows for economy of operation, a rugged powertrain and excellent space utilization in the main cargo area.

Put into utilitarian terms, this gives the van's operator a compact, fuel-stingy vehicle of about 14.5 feet in length, weighing just over 3,000 pounds fully equipped and safely able to carry a payload of 1,650 pounds. This payload potential received additional attention from the Mazda engineers, who were thoughtful enough to include a pneumatically operated suspension.

This subsystem not only ensures a level ride regardless of the loading conditions, but provides the driver with the option of tilting the rear end of the van down to facilitate the loading of heavy items. Normal floor height from the ground is about 1.2 feet, but levels as low as 6 inches are possible with the adjustable suspension feature.

> *“A radio signal from the Global Piloting System satellite selects the required map, which is then displayed on the CRT in the vehicle.”*

The driver's environment also reflects the special nature of the Telecom Delivery. Sitting in an upright position, the driver-cum-telecommunications manager has a commanding position of both the road and the on-board electronics. In addition to the integral CRT screen, the dashboard boasts a built-in telephone and comprehensive LCD instrumentation.

It's easy to imagine Mazda's original concept as a selectively equipped vehicle that could serve as a remote information-gathering station for oil companies, government agencies, security firms or large construction and engineering corporations.

While Mazda is not calling the Telecom Delivery a probable production vehicle at this time, it is definitely testing the waters with this concept and is prepared to develop it into the first turnkey telecommunications center on wheels.

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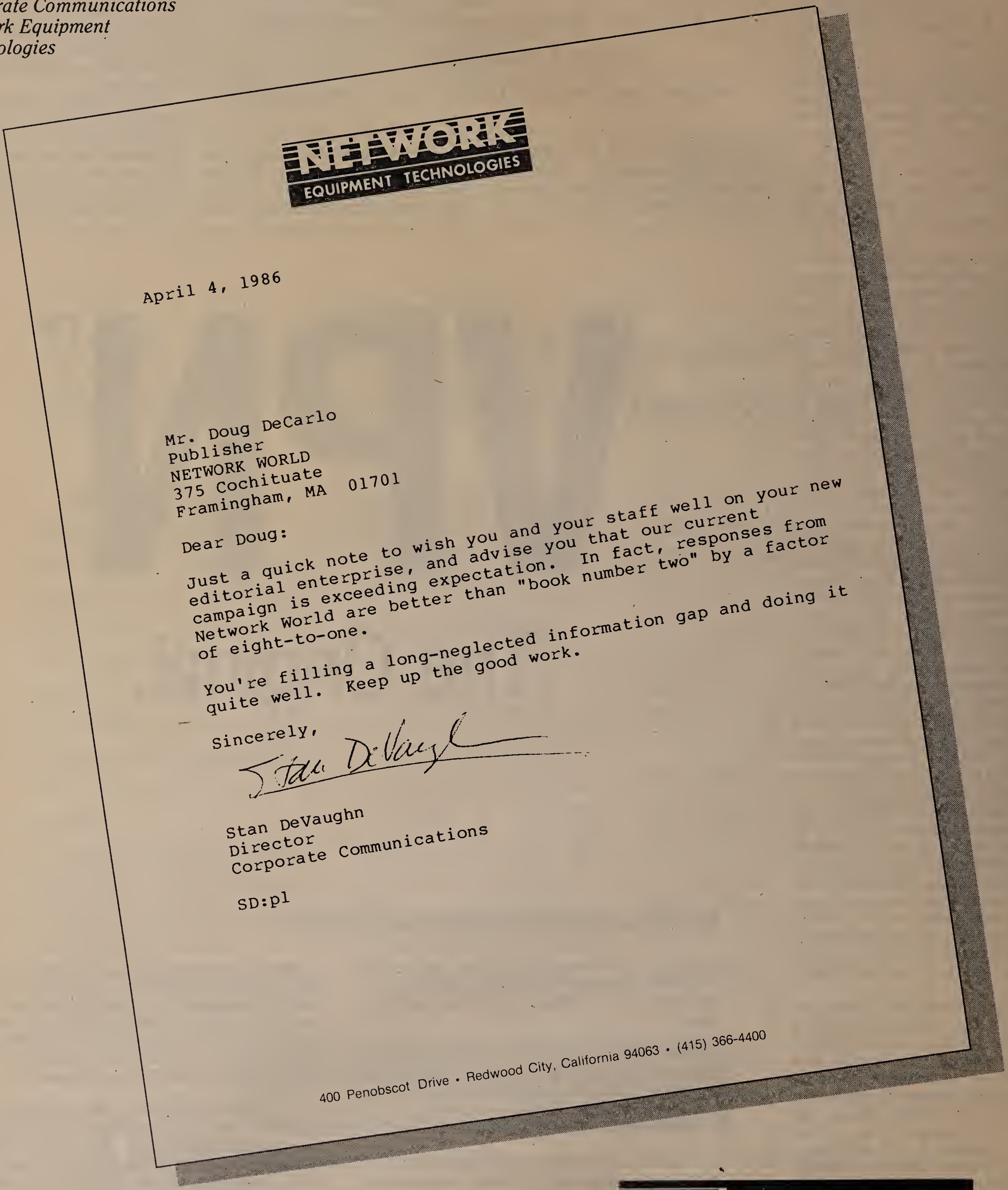

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April 4, 1986

Mr. Doug DeCarlo
Publisher
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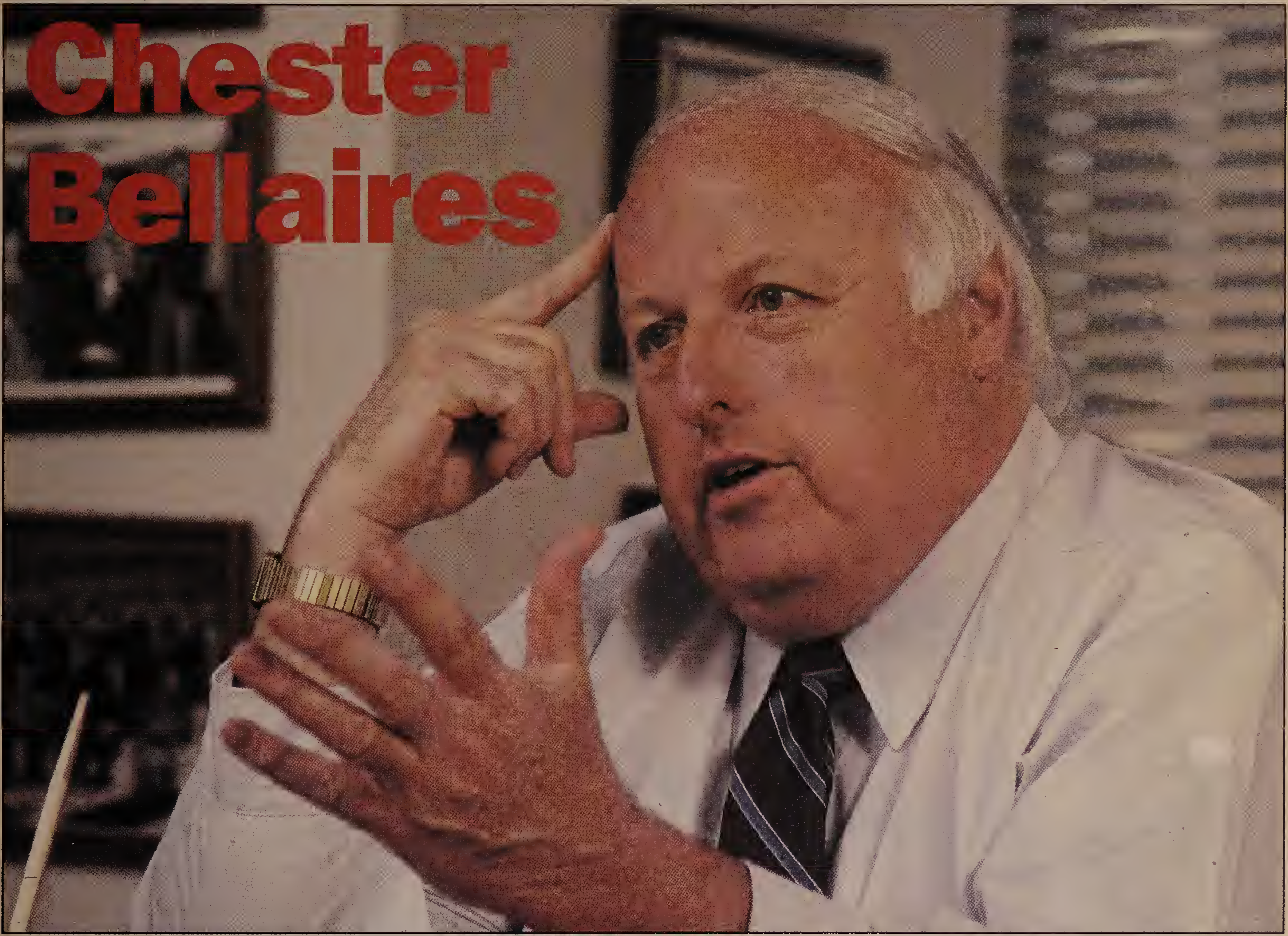
▶ CONTINUED FROM PAGE ONE

ICA's Chester Bellaires



presidency. During his long tenure in the industry, Bellaires has watched communications management tasks evolve from mundane office functions to critical networking strategies within the corporation.

In his corner office overlooking Sixth Avenue, Bellaires recollects that he was introduced to communications almost by default. He began working for the ABC television network in what was called the Office Services Department. His duties in those days included overseeing general office equipment and telephones.

After a two-year stint in the Navy, Bellaires returned to ABC where he continued to work in Office Services, overseeing corporate communications equipment. In 1966, ABC created an independent communications department.

"I was doing the job of overseeing the telephone equipment so long that [management] asked me to head that department," he recalls.

Corporate communications operations were handled as administrative functions until 1985, when the networking division was finally transferred to ABC's MIS department.

Although Capital Cities Corp. merged with ABC in January of 1986, Bellaires' department remains solely responsible for ABC corporate communications.

Television networking is handled separately by a broadcasting division within ABC. ABC's voice and data network extends to affiliate stations in most major cities, with facilities in Los Angeles, Chicago, Washington, D.C. and New York.

The corporate communications department has limited involvement with the broadcasting department, even though corporate communications supports broadcasting operations with voice equipment.

Bellaires divides his department into subgroups, including an outfit that monitors routine communications activities such as moving telephones, and a planning and engineering segment that installs and maintains communications equipment and coordinates network design.

Bellaires has been revamping the network strategic plan under the new management of Capital Cities. He says fast response time makes communications networking excellence as much of an asset in the television business as in the manufacturing business or the airlines. Although voice and data still run separately over the ABC network, Bellaires is considering merging the two types of transmissions. The voice network is tied by a combination of Northern Telecom, Inc.'s SL1 and AT&T's Dimension private branch exchanges.

Bellaires' department is also responsible for feeding information to affiliate stations to alert them to incoming advertising data.

"ABC pays its affiliates to carry those commercials so we make sure the transmissions are received," he says.

"The broadcasting business is very last-minute, and details change up until airtime. When you have a commercial that may cost half a million dollars a minute, you don't want to mess up."

Bellaires is considering using both microwave and T-1 carriers to

☞Continued on **page 36**

From **page 35**

hook up those affiliates that must also receive information regarding commercial positions. The remote locations are currently served by both private lines and a teletype network.

"The broadcast division is setting up a satellite service to feed those affiliates," he says. "We may piggyback the corporate network off of those facilities or install a packet-switching network for those transmissions."

Special events such as the Olympics or a national political convention seldom pose concern for a television network because equipment is usually ordered in advance. Bellaires' corporate telephone network supports the broadcast division during these events.

From tariffs to technology

Bellaires muses about the overwhelming number of changes today's communications manager must face, ranging from tariffs to technology. He says he wonders if an information overload compounded by more administrative duties will place managers at risk in falling behind in evaluating the overall corporate communications picture.

"When tariffs stayed the same for three or four years, I had all the prices memorized," he says. "People could ask me any price, and I could give it to them. Now they say, 'Come on, Bellaires, you must know how much that line costs.' You can't memorize a tariff when it changes every six months."

Bellaires says he is undaunted by new technology. However, he observes that users and vendors alike go overboard when it comes to envisioning and building new product capabilities. Upgrading product capabilities, he says, is a trend that is slowly tapering off.

"When vendors first started to compete with the Bell System, they tried to make a switch that would please everyone," Bellaires recalls. "Now I see some manufacturers are back to making basic products and letting customers add on whatever capabilities they want."

"One product can't be right for a car company, a law firm, a broadcaster, a big company and a small company," he adds.

"To gain a competitive edge, users have selfishly asked for capabilities. But this trend seems to be slowing down. Communications buyers are conservative and want to know every detail about a product."

Skyrocketing costs

According to Bellaires, skyrocketing network costs have helped boost the image of corporate communications managers. This heightened corporate visibility, coupled with steadily increasing salaries, is making the job of communications manager a more attractive career to college students.

"In the past, there were few communications departments," he says. "The employees were just order writers. Now students see that it's possible for a communications employee to make six figures. They can either be on the customer side or jump to the vendor side."

Bellaires sits on New York University's advisory board, which helped the school establish one of the first accredited four-year telecommunications programs. Bellaires also helped establish a communications curriculum at the State University of New York at Albany.

"More schools are looking for accredited programs like NYU's," he says, "which is fine, because our staff has to come from somewhere." The ICA also sponsors a scholarship program for graduate students that involves 10 universities.

ICA preview: ISDN and standards

Based on user surveys conducted by ICA, Bellaires says he expects the big issues at this week's ICA conference to be integrated services digital networks and standards. He suspects many of the emerging technologies, such as software-defined networks and ISDN, are driven by vendor desires more than user needs.

"Many new services are only as vital as vendors make them out to be," he says.

"I'm sure some users believe that vendors try to guide them into products. I guess some of the bigger companies are planning for ISDN, but personally, ABC is nowhere near it."

On the train one recent morning, Bellaires considered his goals as ICA president. He says he is concerned that the organization, which relies on members to volunteer their services, will be short-staffed.

"The increasing responsibilities of the communications manager will make it almost impossible for most individuals to take time away from their jobs," he says.

But new challenges are what make the job of communications manager interesting and will keep many managers, including Bellaires, from dreaming nostalgically of the easy predivestiture days.

"I may have to rely on my staff to help keep up with technology," he says, "but it behooves me to keep myself from getting lost in the shuffle."

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SPECIAL SECTION
Value-added networks

Expert net advice

In these days of hybrid networks, value-added network services are fast becoming indispensable weapons in the communications manager's cost-cutting arsenal. Unfortunately, evaluating the bewildering variety of networking options offered by today's diversified value-added network is a time-consuming managerial task. To help Network World *readers in that task, eight industry experts offer the following tips on evaluating and managing value-added networks.*

Eric Arnum is a data communications analyst with International Resource Development, Inc. in Norwalk, Conn.

"Look for reach first of all. Is this a value-added network, a nationwide network, an international network or a point-to-point local network? Second, look at service. How much of the operation is the vendor willing to fix and maintain? Is it going to be like the phone company and say 'it's not our problem, our circuit tests well,' or will it come out and test your equipment?

"The next question is, 'How can you get into the value-added network?' Do you have to have a dedicated leased line, a dedicated dial-up port — which means a modem that's actually sitting there, in your name, waiting for you to call — or is it a public dial-up, meaning first-come, first-served to each port? That's important in terms of cost.

"If you have a cash register that you only want to hook up to the host at the end of the day for 10 minutes, you certainly want a public dial-up port.

"If you have a credit authorization system, you're going to want a dedicated dial-up port. That means that when that machine calls to check a number, the line won't be busy. And if you're going to have someone on a terminal accessing the host computer every 10 minutes, you're going to certainly want dedicated leased lines.

"The last thing would be the applications themselves. If the customer comes up with an application, will the network run it for him? If the company comes up with a better way to tally up its cash registers at the end of the day, will it have to run that from its hosts or will the network vendor install it on its nodes as software? With an added value in the application, you can save a lot of money if the network will do it for you."

Clint DeGabrielle is vice-president of marketing and field operations for Tymnet/McDonnell Douglas Network Systems, Inc. in San Jose, Calif.

On implementing a value-added network: "First, develop a realistic schedule. Second, develop a set of expectations that are consistent with the service you are buying. Third, involve the vendor in implementing the service. So many people buy the service and go off on their own to implement it. If there are little blips, it leaves a sour taste among their users, and it makes it very difficult to accept [the service] well.

"Understand what communications requirements you have and what is a cost-effective level at which you should provide those communications. It would be well worth it to take a look at the value-added network and determine what that network's progress is in bringing new products to the marketplace over the past two or three years. What's their progress this year?"

Frank Dzubeck is president of Communications Network Architects, Inc. in Washington, D.C.

"The development of costs in the public network arena involves what we call the turnpike

Continued on page 38

ANTHONY SCHULTZ

From **page 37**

effect. Turnpikes were built based on certain usage criteria. As soon as they became available, everybody left the other roadways and went onto the turnpikes. Suddenly you had usage that was totally unanticipated.

"The same thing is true in major networks, and it is one of the primary problems in the selection of value-added networks. You can't use any volume figures that you currently have — you have to use anticipated volume figures. Initially, most people totally underestimate the usage, and suddenly they find themselves hit with these extremely large bills. It's human nature. Once you've got a convenience item, you use it.

"More than anything else, users must have a handle on where they need service."

"The discounting policies that the myriad of value-added network vendors offer on the basis of usage are not laid out up front. If you don't ask about it, you don't get it."

Jim Herman is director of the Telecommunications Consulting Group at BBN Communications Corp. in Cambridge, Mass.

"More than anything else, users must have a handle on where they need service, in what amounts and over what time periods. The goal is to create a traffic matrix that shows for each customer location and end-point in the organization how much traffic it needs to send to every other end-point. Most people don't have that when making a decision about obtaining a value-added network service.

"Whether buying a very small aperture terminal system and bypassing the public carriers is more cost-effective than going with public systems depends upon the number of locations the user has, how dispersed they are and how much traffic goes between them. If all traffic radiates toward a single point vs. a more distributed requirement between a lot of locations, [then a Vsat system might be more cost-effective].

"Don't just look at the statistics on the speeds and capacities of the boxes. Look at the kind of support organization that the vendor has, because you will need that to make it work, unless you have a lot of in-house expertise already.

"When you buy from a public value-added network, you don't have a network management problem: They take care of it for you. You don't have control, but you don't have to hire people to have the expertise in-house to be able to manage the system. That's a major choice people have to make.

"Keep tight control over the inventory of network equipment; where it is, what the configurations are and what versions of software you have. It's easy to loose track of all that, and it's very difficult to get a handle on it after you've lost track of it.

"If you need to connect to somebody for less than 1½ hours per day, you should stick with dial-up. But if you go over that amount, you should move to a leased-line with modems."

Steve Morgan is senior consultant at Telecommunications International, Inc. in Denver.

"Look at the vendor's qualifications and financial statements, as well as its customer references. Make sure it can support growth.

"My pet peeve is products that are announced

Continued on **page 39**

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that aren't delivered. You've got to know yourself. If you don't know what you want and what you have — your software and hardware — you're going to make mistakes. You've got to ask them the right questions to make sure their product fits your needs. You don't want the foot fitting the shoe."

Alan Schaevitz is director of the San Francisco office of Network Strategies, Inc., based in Burke, Va.

"A lot of companies tend to look at packet networks as a big black box. They can plug a terminal into one side and a host at the other end, and whatever happens in the middle is irrelevant.

"I don't think that's true. The internal workings of the packet network can have a profound impact on the performance and service the customer gets.

"Public value-added networks use different algorithmns for determining what their rates are going to be. For instance, Telenet, Inc. charges on a kilopacket basis, whereas Tymnet charges on a kilocharacter basis. The nature of the data traffic will determine which of those two networks is the most economical.

"If the data that you submit to the network tends to be large chunks of data — large full-string interactive or batch traffic of some sort — you're more likely to fill up packets. In this case, the Telenet approach would be more economical. If you tend to send very short, small, bursts of interactive traffic, where you would not normally fill up a 128-octet packet — you're talking 10, 20 characters — then something that charges you on a kilocharacter basis might be more economical.

"That implies that users have to have a better understanding of the traffic pattern to know how to select the right vendor.

"A lot of people don't realize that the host connection has to be a leased circuit connection. Generally you want to use X.25 so you can have a single circuit handling multiple users simultaneously.

"The other option many vendors offer is a packet assembler/disassembler (PAD) device at the host end. With this device, users get a single pipe from the network to their premises. But the user still has to pay for all those ports on his host front end.

"If he can bring X.25 directly into his front end, then he has one port to contend with and he can still support a multiple number of users. That's an economic advantage. But to do that you've got to be able to support X.25 on the host. Not all hosts do that, although the list of vendors that support X.25 in native mode is growing.

"On the terminal end, you always have a choice. If the terminals are in a location where their connection time is long enough, you can put a vendor-supplied PAD on your premises so that the terminal connections to the PAD are direct connections rather than phone company circuits, and you share multiple terminals across a single pipe into the vendor.

"There again, you're going to have a leased circuit and a PAD to pay for per month. If you don't have that kind of traffic, then you can have dial access, in which case there is a connect time charge, a monthly service charge to keep track of your account and usage-sensitive charges on the number of characters or packages sent during that session.

"There's a migration path to a private network that I think is worth thinking about up front when you select your public vendor. Is the vendor of your public packet network the one you would want to buy your private packet network from?

"One of the advantages you can get from Telenet, Tymnet and even Uninet, Inc. at this point is that if you begin to build a private packet network from their software and hardware bases, they will offer you a connection into the public packet network from your private packet network. You can think of the public network as an extension of your private network that allows you to get to places where you couldn't afford to put your own node. But if your private network is a different brand of equipment from the public network, that is more complex.

> *"A lot of people don't realize that the host connection has to be a leased circuit connection."*

"[Companies that don't have the expertise in-house] can get sold on a bill of goods for a particular service or feature that they don't need or that doesn't work as well as it is touted to work. I've seen circumstances where companies have been sold digital access, only to find that the local carrier of that service is not up to speed on maintaining that service.

"A lot of times, when companies start to go to a public packet network, they don't adequately research where the network is and the distance between the nearest node of that carrier and the locations that the company wants to connect to.

"They will often find that instead of being connected to a major node, as they had thought they might be and on which they predicted the network's performance, they are connected to a local concentrator of that packet network. The node is actually many miles away.

"That can impact performance because you have additional propagation delay.

"One mistake many companies make is to rely on the security functions provided by the public network — closed user groups, user IDs and sign-ons, that sort of thing — to provide the screening mechanism to prohibit unauthorized users from getting access to the computer. In doing so, they often lower their guard within their own host system. This is a dreadful mistake."

John Vernagus is manager of marketing programs at GTE Telenet Communications Corp. in Reston, Va.

"Each value-added network has its own characteristics in terms of coverage areas and product capabilities. No matter how many sites a value-added network advertises, it doesn't do a lot of good unless they are in your location. A lot of the advertising literature stretches the numbers of connections.

"Users tend to be very enamored with the technology. They talk a lot about bits and bytes without converting it to end-user benefits. Certainly having X.25 is nice, but what does that really mean to the user?

"Basically, it translates into cost-effectiveness, ease of use and quality of service. Those are the things people really buy on. They don't buy because of certain technological factors; they're buying a benefit.

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"The key is to match your current and future needs to what that value-added network is offering. If you're looking for a station wagon, you don't want to buy a Cadillac."

Mark Winther is director of Communication Services at Link Resources Corp. in New York.

"Some of the smaller value-added networks have much better technology because they're newer. They have more state-of-the-art switches and nodes; they're faster; they're more intelligent; and they may be capable of handling applications more efficiently than the large networks.

"So it's well worth it to look at some of the smaller value-added networks like Compuserve or Computer Sciences Corp.'s Infonet. They are in specific industries and have strengths over the big value-added networks like Telenet and Tymnet.

"If you have an internal network and a value-added network and you want to interface the two, it is often difficult to get the value-added network vendor to write the software.

"Often users will end up writing the software themselves, which can get pretty expensive. Third-party vendors don't have nearly the product line that they could have to solve the user's needs, particularly in the area of internetworking.

"To determine his needs, the user has to identify the remote users and then analyze the usage. Assuming that the users require regular access to a host computer, for a public value-added network [to be cost-effective], usage is typically no more than three hours a day. Beyond that, it usually makes more sense to go to a leased line.

> *"If you're looking for a station wagon, you don't want a Cadillac."*

"Many vendors have a pricing strategy that goes from usage-based to fixed. If you are using more than 1,000 hours per month, for example, it might make sense to go to a different pricing structure.

"It's important to monitor usage to take advantage of those kinds of optional pricing. There are published price lists, but you can always make a deal depending upon your volume. Vendors are very open to doing special packages.

"Some of the value-added networks have much better international capabilities. Some have their own operations overseas, like [General Electric Information Services Co.], Computer Sciences or Telenet. You're better off going with a value-added network that has its own operations abroad or a joint venture with a Postal Telephone and Telegraph rather than just having someone else operate it for you.

One problem is how long it takes a network to do something you want it to do. If you need something specific, like a 56K-bit/sec X.25 connection, some of the networks are quicker at bringing those things up, testing [them] out and running [them] than others. Some vendors say that they'll do it, but it takes six months to a year before they actually have it running.

"It's easier logistically to deal with one point of contact for value-added network services, but at the same time, it's not a great idea to become dependent upon one vendor. The issue of how many vendors to go to for what you need can be a real economic dog.

> *"There are published price lists, but you can always make a deal depending upon your volume."*

"Some vendors will dedicate ports for your use so you are not contending with other users.

"Major traffic on the value-added networks are for consumer information services like The Source and Dow Jones News Retrieval. If you're a corporate user, you don't want to be contending with consumers dialing up information services.

"All value-added networks should be able to provide a backup system in the form of a dial-up line or possibly switched 56 [K-bit/sec] service, which is an emerging technology for the phone companies. Most vendors charge a premium for backup systems."▣

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1 **My primary areas of activity.** Circle ONE only.

1 am involved in evaluating communications (data, voice and /or image) products and services:

1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both

1a **For communications, my primary responsibility is:** Circle ONE only.

1. Data Communications
2. Voice Communications
3. Both

2 **Circle only the ONE title classification which most applies to you.**

Company Management

11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CIO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management

Data Communications

21. Management
    VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff
    Supervisor, Head : Networking, Design, Analysis, Engineering, R&D, Applications, Services

Telecommunications

31. Management
    VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff
    Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services

Factory Communications

41. Management
42. Supervisory/Staff

MIS/Data Processing

51. Management
    VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of System Design, Analysis, Applications

Others

75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other ____________

3 **Job Function**
Which one of the following best describes your functional involvement with communications (data, voice, and/or video) products? Circle ONE only.

Corporate

1. Business Management, Planning and/or Development

Communications System/Network

2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other ____________

4 **Which one of the following best describes the primary business activity of your organization at this location?** Circle ONE only.

Consultants

11. DP/Communications Consulting Services
12. Consulting Services (except DP/Communications)

End Users

13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/Construction/Petroleum Refining/ Agriculture/Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors

41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, Intern'l Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other ____________

5 **In which ways do you typically become involved in acquiring communications products (data, voice, and/or video) and services?** Circle ALL that apply.

1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 **Check ALL that apply in columns A and B.**

A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:

B. These products and services are presently in use at this location:

A B *Product/Services*

Computers

01. ☐ ☐ Micros
02. ☐ ☐ Minis
03. ☐ ☐ Mainframes

Data Communications

04. ☐ ☐ Communications Processors
05. ☐ ☐ Comm./Networks Software
06. ☐ ☐ Digital Switching Equipment
07. ☐ ☐ Facsimile
08. ☐ ☐ Modems
09. ☐ ☐ Multiplexers
10. ☐ ☐ Protocol Converters
11. ☐ ☐ Network Mgmt. & Control
12. ☐ ☐ Test Equipment
13. ☐ ☐ 3270 Controllers

Telecommunications

14. ☐ ☐ PBXs
15. ☐ ☐ Key Systems
16. ☐ ☐ Central Office Equipment
17. ☐ ☐ Integrated Voice/Data Terminals

A B *Product/Services*

Transmission/Network Services Equipment

18. ☐ ☐ Microwave
19. ☐ ☐ Satellite Earth Stations
20. ☐ ☐ Local Area Networks
21. ☐ ☐ Wide Area Networks
22. ☐ ☐ Packet Switching Equipment
23. ☐ ☐ Fiber Optic Equipment

Communications Services

24. ☐ ☐ Packet Switching Services
25. ☐ ☐ Cellular Mobile Radio Services
26. ☐ ☐ Electronic Mail
27. ☐ ☐ Enhanced Services
28. ☐ ☐ Centrex

7 **Estimated value of communications systems, equipment and services:**

A. which you helped specify, recommend or approve in *last* 12 months? Check only ONE in column A.

B. which you plan to specify, recommend or approve in *next* 12 months? Check only ONE in column B.

A B

1. ☐ ☐ Over 10 million
2. ☐ ☐ $5-10 million
3. ☐ ☐ $1-5 million
4. ☐ ☐ $500,000-1 million
5. ☐ ☐ $250,000-500,000
6. ☐ ☐ $100,000-250,000
7. ☐ ☐ $50,000-100,000
8. ☐ ☐ Under 50,000
9. ☐ ☐ Don't know

8 **Estimated gross annual revenues for your entire company/institution:**

Circle only ONE.

1. Over $1 billion
2. $100 million to $1 billion
3. $5 million to $100 million
4. Under $5 million

9 **Estimated number of total employees at this location:**

Circle only ONE.

1. Over 5,000
2. 1,000-4,999
3. 500-999
4. 250-499
5. 100-249
6. 50-99
7. 20-49
8. 1-19

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SPECIAL SECTION
Value-added networks

The vendor vanguard

BY KARYL SCOTT
Washington, D.C. Correspondent

Not long ago, the term value-added network meant packet switching with some protocol conversion thrown in. Today, those technologies are merely the foundation for a vast array of emerging services and applications.

As competition heats up in the enhanced data communications market, and as user demand intensifies, vendors are developing increasingly sophisticated business applications targeted at specific market niches, such as the medical, manufacturing and transportation industries.

The proliferation of desktop computers and the need to interconnect them are major factors in the expected increase in value-added network offerings. The network market generated about $300 million worth of revenue in 1985, according to Frost & Sullivan, Inc., a market research firm in New York. The market is expected to reach the $1.5-billion mark by 1990, growing 30% annually for the next five years, according to forecasts by Link Resources Corp. in New York.

> *“The term ‘value-added network’ no longer refers only to public data nets, but also to a variety of intelligent public and private offerings such as wide-area nets.”*

The term “value-added network” no longer refers only to public data networks, but also to a variety of intelligent public, private and hybrid offerings such as wide-area networks, metropolitan-area networks and software-defined networks.

The increasing sophistication of packet networks allows foreign hosts to communicate with IBM hosts through network protocols built into the network. Interfaces and gateways allow X.400 and X.25 protocols to communicate with the IBM Systems Network Architecture environment. Other options include facsimile-to-value-added network communications.

The Federal Communications Commission recently allowed the Bell operating companies to enter the packet network business and to provide protocol conversion. Although the operating companies do not have a strong presence in the market yet, analysts say they are expected to increase competition and accelerate new applications as well as drive down the cost of basic user services.

The fastest growing segment of the U.S. value-added network services market is expected to be in local exchange areas, where the BOCs have targeted a largely untapped group of small business and residential customers.

Bell Atlantic Corp., Pacific Telesis Group, BellSouth Corp. and Southern New England Telephone Co. are leading the way with local area data transport services (LADT), which provide simultaneous voice and data services over conventional telephone lines.

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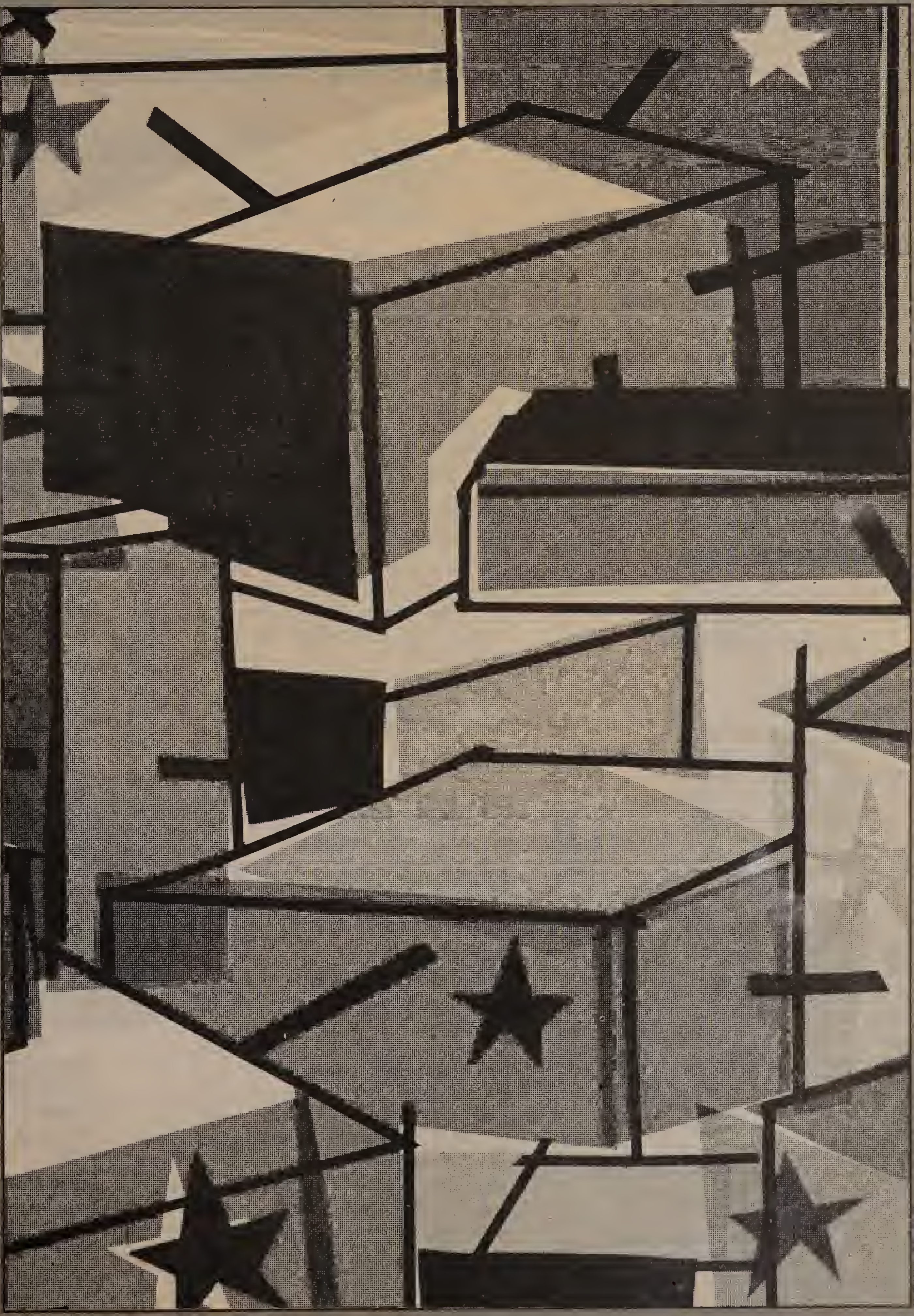

ANTHONY SCHULTZ

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Southern New England Telephone has developed a packet-switching network for the Connecticut area that will provide access to Tymnet under an agreement inked last January. This venture between a nationwide value-added network and a BOC raises questions about the legal implications of a BOC offering services outside its designated local access and transport area. If such ventures are permitted, the BOCs may be able to offer users a wide variety of applications in a short period of time and develop an imposing market presence.

"Value-added network services are difficult to sell unless you have the applications to support the services offered. A vendor needs to have the applications in place before the system can grow," according to Frank Dzubeck, president of Communications Network Architects, a networking consulting firm in Washington, D.C.

"Vendors have to provide value-added services that the user cannot provide for himself in the private environment," Dzubeck says. "Value-added network services must be structured around things that don't exist in the private world. Users must have intrinsic benefits to justify the recurring cost of using that [value-added network] carrier."

Value-added network applications such as electronic mail, data base access, electronic funds transfer, remote order entry and credit verification are standard offerings today. Some of the latest service enhancements include internetwork access, international document delivery, transaction processing interfacing and software distribution.

The major players in the market are GTE Telenet Communications Corp. and Tymnet/McDonnell Douglas Network Systems, Inc. A fourth major value-added network service, Uninet, will likely be dismantled as a result of the recently proposed merger of GTE Telenet's corporate parent, GTE Sprint Communications Corp., and Uninet's owner, United Telecommunications, Inc. If most former Uninet customers migrate to Telenet, that network may enjoy more than a 50% market share. Telenet currently has the largest market share, estimated at 42%, according to Mark Winther, an analyst with Link Resources Corp. in New York. Tymnet has a 33% share, and Uninet has 10%.

> *"The major players in the market are GTE Telenet and Tymnet/McDonnell Douglas."*

GTE Telenet President J. David Hann admits that the merger will affect user services in the coming year. "I see some dislocation, but it won't be a big problem," he said.

The merging companies decided to phase out Uninet, rather than integrate it with Telenet because of the difficulty and expense of reconciling significant differences between the protocols the two networks use for network management and other functions. The capacity of the Telenet service will be expanded to accommodate former Uninet customers.

Winther says the merger could cause user dislocation and confusion, prompting some customers to seek other vendors. Large data base companies that use several value-added networks will not be as strongly affected as companies that are dependent solely upon Telenet or Uninet.

Uninet was developed in the late 1960s for United Telecommunications' internal use and was first commercially marketed in 1984. Service is provided from more than

Continued on **page 43**

> *"Some of the latest service enhancements include internetwork access, international document delivery, transaction processing interfacing and software distribution."*

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T-3 **Cost Efficient Methods for Implementing New Tariffs**
Cheryl A. Cushing, Manager, Reference Services, Connections Telecommunications, Inc.
Post-divestiture tariff rules, including LATAs and POPs with a comparison of major common-carrier tariffs, and evaluation of intra-LATA access alternatives and a review of new regulatory alternatives to traditional network costs.

T-4 **ISDN I**
Samuel Lynch, Senior Consultant, Zatyko Associates.
Definition and concepts, application standards and world-wide status, plus comparison of ISDN against OSI Reference Model as standard.

T-5 **System Network Architecture I**
Thomas Routt, Senior Consultant, Zatyko Associates.
Current status of IBM's communication architecture, new extensions such as LU 6.2/APPC and NETBIOS and IBM LANs as "defacto" standards.

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500 metropolitan areas and 50 overseas locations via international record carriers.

Tymnet was formed to support its former parent company's data communications needs. It began offering shared usage of the network in 1975. Several years ago it was acquired by McDonnell Douglas as part of its Information Systems Group.

The parent company says Tymnet has experienced an estimated 35% growth rate over the past several years. The Information Systems Group lost a reported $109 million in 1985, in large part due to costs from the acquisition and reorganization of its Tymshare division, of which Tymnet is a part.

Telenet services currently include electronic mail service, electronic software distribution, point-of-sale transaction processing and credit card authorization. Services also include network management tools for hybrid networks and Telemail Xpress, which allows electronic mail senders to have a hard copy delivered by the postal service within two business days.

Tymnet develops private and hybrid networks for large customers and offers centralized network management for those private networks. The firm recently began offering a public satellite service, using two-way micro earth stations as an alternative to leased-line data communications.

According to Mary Chalmers, IBM product manager at Tymnet, her company has placed a heavy emphasis on the IBM world, providing compatibility to IBM users who need to bridge the multivendor gap.

"There is a huge installed base of IBM equipment, and that's not going to change overnight. We're targeting that market," Chalmers says.

Another area in which Tymnet has been successful is connecting remote computer users to corporate hosts. Using the X.25 network can be an economical alternative to Wats lines, said Richard Edwards, Tymnet regional manager.

Where Tymnet leaves off, the other McDonnell Douglas Information Services companies pick up with applications built on top of the value-added network. Those companies focus on verticle markets such as health care, financial services and manufacturing sectors. Other players in the field include General Electric Information Services Co. (Geisco), IBM, CompuServe, Inc., MCI Communications Corp., Computer Sciences Corp., Automatic Data Processing, Inc. and Wang Laboratories, Inc.

One firm conspicuously missing from the list is AT&T. AT&T decided to withdraw its Net 1000 value-added network from the market after sustaining astronomical losses. AT&T spent more than $1 billion on the network, which failed to achieve either commercial or technological success. AT&T invested 10-years' worth of research and development, but was never able to develop the critical focus for the service or the applications that would convince customers to process their data on AT&T's network.

Although Geisco is not exclusively a value-added network vendor, its recent market thrust most closely fits the emerging value-added communications concept. Geisco is a computer service bureau that developed as a time-sharing business in 1964. Two years ago, Geisco

Continued on **page 44**

"Tymnet was formed to support its former parent company's data communications needs and began offering shared usage of the network in 1975. Several years ago it was acquired by McDonnell Douglas."

"Telenet services include point-of-sale transaction processing and Telemail Xpress."

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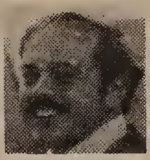
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T-6 Public/Private Data Network I
Daniel Zatyko, President, Zatyko Associates.
Current status of IBM's communication architecture, including applications and standards, and development of X.25 up to 1988 CCITT adoption.

T-7 MAP/TOP Systems Interconnection I
Donald Harring, Vice President, Zatyko Associates.
Status of seven layer OSI Reference Model as framework for future network compatibility, review of major vendor architecture - IBM, DEC, etc; migration to manufacturing automation and office communication protocols.

Tuesday, June 10, 1986

9:00 am - 5:00 pm
Select One

T-8 Planning the Network Control Center
Gabriel Kasperek, President, Kazcom, Inc.
User considerations in the design, equipment selection, software, and instrumentation of a network control center and related vendor issues.

T-9 Problem Resolution and Network Management in SNA Networks
Fred Cook, Senior Consultant Kaptronix.
Techniques useful in analyzing problems in SNA networks. Topics include detailed SNA sequences, VTAM trace, NCCF, NPDA, NLDM and a review of critical parameters in NCP System Generation.

T-10 Network Modeling/Design Workshop
Larry Rhue, Vice President, Connections Telecommunications Inc.
Network design calculations using MNDS PC-based design software and the complimentary Borland SIDEKICK package. Also included, queuing calculations in simple and complex network models, reflecting SDLC, BSC and X.25 protocols, statistical multiplexers and distributed concentrator networks.

T-11 ISDN II
Samuel Lynch, Senior Consultant, Zatyko Associates.
Technology and system/network/switching of ISDN, and certification and network testing, including 1986/87 field trials/user implementation.

T-12 System Network Architecture II
Thomas Routt, Senior Consultant, Zatyko Associates.
Technology and systems impact of SNA and relation to open architectures and protocols on networks from DEC and other vendors, and higher layer SNA services - DIA/DCA, PU 2.1, etc.

T-13 Public/Private Data Network II
Daniel Zatyko, President, Zatyko Associates.
Technology and systems impact of long distance, regional and in-house data networks, including message handling systems and office document interchange formats under different operating systems.

T-14 MAP/TOP Systems Interconnection II
Donald Harring, Vice President, Zatyko Associates.
Session will cover MAP/TOP common protocol connectivity, GM and Boeing programs, other vendor demos, user experiences and the implications of Corporation for Open Systems on MAP/TOP, vendor standards and products.

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NW2

From **page 43**

moved away from the time-sharing concept, unbundled its network offerings and targeted verticle markets for which it can build applications and use the huge international network of its parent company.

Company officials say Geisco is now focused to offer "network-based services — products or applications that address communications needs across a broad range of industries," according to Vice-President of marketing James McNerny.

Geisco offers software-based services for electronic data interchange in trade, distribution and payment markets. Like the McDonnell Douglas Information Services companies, Geisco has targeted verticle markets and intercorporate communications. "Geisco hopes to develop applications that will allow corporations in a particular industry to exchange information and documents between corporate networks," according to Raymond Marshall, vice-president of technology.

> *"Like the McDonnell Douglas companies, Geisco has targeted verticle markets and intercorporate communications."*

IBM's Information Network is an SNA-based network designed to offer high-speed data transmission and data processing to companies that are heavy IBM users. IBM won a contract to provide its service to the Insurance Institute for Research in 1983.

Information Network has not been profitable for IBM, according to industry observers. Industry analyst George Colony of Forrester Research, Inc, in Cambridge, Mass., estimates that IBM has lost $30 million to $50 million on the project. Information Network was designed as a low-level, closed communications medium that does not allow other manufacturers' equipment to communicate over it.

IBM, Telenet, Tymnet and Geisco have all teamed up with overseas players to offer value-added network services in newly deregulated foreign markets. IBM has joined Mitsubishi and Nippon Telegraph & Telephone Corp. to provide value-added data communications in Japan. IBM has also been trying to get a foothold in the UK, but the British government nixed a joint venture between IBM and British Telecom International last year because it did not want IBM to gain a stronghold over the British telecommunications market.

IBM's French subsidiary announced recently that it was entering a joint agreement with two French companies to offer a value-added network in France. Paribas, a leading French bank, and Sema-Matra, a French data processing company, along with IBM will each invest $71.6 million in the venture. The value-added network will use Transpac, the French packet-switching network as the basic transmission medium. The value-added network will not be limited to SNA connectivity.

Geisco has hooked up with Nippon Electric Corp. to sell value-added network services in Japan. GTE Telenet is working with Intec, a Japanese computer and communications company, and four other Japanese firms to establish an international value-added network. Tymnet and a Japanese consortium are combining efforts to bring Tymnet services to Japan. AT&T teamed up with a Japanese consortium of trading and communications companies to form Japan ENS Corp. The failure of Net 1000 has left a technological void, and AT&T is working to supply a network to the venture.

> *"IBM's Information Network is an SNA-based net designed to offer high-speed data transmission."*

The maturing value-added market market is moving toward more user options and innovative pricing policies. The battle to create new services while keeping prices down is coupled with the struggle for market share and profitability. ◼

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OQ

Data base machine from **page 2**

rules that all our machines would understand."

A data base machine can supply that set of rules. Processors on a network can access the data base if they have the proper communications and applications software. With such software, a processor views a data base machine as nothing more than a peripheral, like a printer or a disk drive.

Data base machines consist of relational data base management software and hardware specifically designed to support data manipulation functions. The allure of these systems stems from the fact that data base management software has traditionally been viewed as a memory hog.

Relational date base management systems run on hardware designed during the age of batch processing, so often they chew up gobs of central processor time and slow system response. The custom designed data base hardware frees host system resources, which in turn boosts response time, according to data base machine vendors.

Despite the rather straightforward benefit, corporations currently using the technology are few, and those like Philip Morris that use the machine to tie a number of different systems together are even more scarce.

Even though the concept of data base machines has been discussed for a number of years, only recently did companies begin to manufacture the machines. The leader in the field, Britton-Lee, based in Los Gatos, Calif., has a line of machines designed to work with DEC VAXs. Teradata Corp., another principal supplier, has a line aimed at large IBM shops.

One reason that few companies have warmed up to the idea of data base machines is that the technology is new.

"A lot of companies, especially in the mainframe area, have a wait and see attitude toward the machines," said Ronald G. Ross, editor of *Database Newsletter*, published by Database Research Group, Inc. in Boston. "Until there are some documented cases of substantial cost savings, most companies will be content to just sit on the fence and wait for these machines to evolve."

A second shortcoming is that most data base machines support only a limited number of central processors. Interfaces have to be developed to increase the variety of machines that can be tied to a data base machine.

Two types of interfaces are needed. Physical connections such as an RS-232 port are needed to plug the data base machine into a network or a host processor. Support for these connections is somewhat limited. For example, Britton-Lee's products support Ethernet, RS-232, RS-488 and IBM block multiplexer connections.

Even with the proper physical connection, a user might not be able to use his system to access a data base machine. Software is needed on the data base machine and on the user's system to enable data to be exchanged by the two machines.

Britton-Lee has software for a number of microcomputers, Unix-based systems and DEC equipment. Teradata's offering is primarily limited to IBM mainframes, and the company has had some success luring Big Blue shops to its fold. Wells Fargo & Co. and Citicorp have both purchased Teradata products.

> *"The allure stems from data base management software traditionally being viewed as a memory hog."*

A principal benefit of data base machines is that, regardless of the system used, the machine should supply its users with a consistent interface. Most machines work with Structured Query Language (SQL), a programming interface developed by IBM. SQL is a limited number of powerful commands designed to help users easily access a data base.

A data base machine shortcoming is that SQL support varies on different types of processors. The programming interface is well supported in the IBM mainframe world. However, few microcomputer packages work with the programming interface.

Despite the shortcomings, the data base machine market seems to be growing steadily. "Data base machines will not take the place of data base managers," said Damian Rinaldi, director of software research at International Data Corp., a Framingham, Mass., market research firm. "They are well suited to companies with large data base applications that could be best processed on a dedicated machine," he added.

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▶ GTE SPACENET

Vsat services announced

BY BOB WALLACE
Senior Writer

ATLANTA — At the International Communications Association (ICA) conference today, GTE Spacenet Corp. is expected to introduce a transmit/receive very small aperture terminal (Vsat) service. It is also expected to debut a receive-only point-to-multipoint satellite service and a point-to-point Vsat offering.

The debut of the Vsat-based service comes on the heels of the Federal Communications Commission's decision to allow AT&T Communications, Inc. to begin selling its Vsat-based Skynet Star Network Service ("AT&T starts Vsat service," *Network World*, May 26).

The entrance of these satellite service players into the fast-developing Vsat service market will give interested users a variety of vendors from which to choose. All three new Ku-band services will use transponders on GTE Spacenet satellites.

The Skynet Interactive Network Data Service uses Vsats ranging in size from 1.2 meters to 1.8 meters. The transmit/receive service supports data rates from 2,400 to 56K bit/sec.

The hub earth station used in this network service ranges from 4.5 meters to 11 meters in diameter. The service supports X.25, IBM's Systems Network Architecture, Synchronous Data-Link Control, High-Level Data Link Control and Binary Synchronous Communication protocols.

Dr. Jerry Waylan, president of GTE Spacenet, said the company does not manufacture Vsats, but can package those produced by other vendors for use with the three services. Users may opt to purchase the equipment necessary for each individual satellite service.

Hub earth stations, which transmit and receive data via the Ku-band satellite, are located in New York City, Chicago, Los Angeles and Houston. "Users have the option of either sharing a hub station with other users, or purchasing their own hub for private use," Waylan explained.

He said users with a small number of sites and a low amount of network traffic would be best advised to explore the possibility of sending and receiving data via a shared hub. A shared hub is partitioned to allow multiple users to utilize the facility. A hub earth station could cost the user anywhere from several hundred thousand dollars to $1 million.

The Skystar Multipoint Data Service uses the hub station to simultaneously transmit one-way data to numerous geographically dispersed locations. The service accommodates data speeds from 300 bit/sec to 56K bit/sec.

The Skystar Point-to-Point Data Service provides users a dedicated link between two locations. A prospective user would either install 1.2-meter or 2.4-meter Vsats for both locations. If a user equips both locations with 1.2-meter Vsats, a data rate of 56K bit/sec can be supported across the link. A user installing 2.4-meter Vsats at both sites can pass data from location to location at speeds up to 112K bit/sec.

The service's ancillary equipment can be interfaced to such standard synchronous data sources as host computers, computer-aided design and manufacturing equipment, compressed digital video coder and decoders, and voice/data multiplexers. ◼

▶SALARY SURVEY

Net execs top list

BY MARGIE SEMILOF
Senior Writer

NEW YORK — An increased demand for communications professionals has driven up total compensation, which includes salaries and other benefits, more than 28% above 1985 levels, according to a recently released survey. The study said salaries for communications executives increased from an average of $100,000 in 1985 to $130,000 this year.

The survey, conducted by Edward Perlin Associates here, measured compensation levels for data processing executives — a category that includes such job titles as communications manager, data communications software manager, telecommunications service manager and international communications network planner, as well as traditional DP positions.

Compensation up 15%

Overall, DP professionals enjoyed an average compensation package increase of 15% in 1986.

That figure is double the compensation increase listed for noncomputer-related executives, who posted gains of only 6% to 7% in 1986.

Survey authors said the rate of salary growth for DP executives is the highest in the four years since the consulting firm began conducting the annual survey.

"Firms are doing all they can to reduce turnover," said Michael Roos, a spokesman for Edward Perlin Associates.

"Corporate management is realizing that communications executives are scarce and valuable."

OA execs post decline

Among DP professionals, only office automation executives posted a decrease in compensation levels. According to Roos, an office automation executive is defined as a senior level manager in charge of strategic planning, plus the acquisition and installation of equipment.

The average compensation decrease experienced by professionals in that category was attributed to the fact that office automation tasks are increasingly assigned to junior level executives.

"In some companies, the job of office automation is becoming an end-user function," Roos said. "A company may plan a huge installation of personal computers. But once they are installed, the task of maintaining the equipment may be handed down to a manager with more specific communications expertise."

"The office automation task has changed dramatically because of changes in technology," Roos added. "It's easier for a company to implement those services without specialists."

Survey based on 1,000

The survey was based on questionnaires distributed among more than 1,000 information processing industry executives.

Those executives' yearly salaries ranged from $58,000 to $149,000. When bonuses and other forms of cash perks such as stock options were included, executive compensation ballooned from $150,000 to more than $400,000 per year.

The respondents worked for some of the largest U.S. companies, including American Express Co., Manufacturers Hanover Trust Co., Dean Witter Reynolds, Inc. and Columbia Pictures Industries, Inc.

The report, entitled "1986 Salary Survey, Information Management/Data Processing Executive Positions," is available from Edward Perlin Associates, 276 Fifth Avenue, New York, N.Y. 10001.

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LU 6.2 from **page 1**

suite of commonly used office applications.

Longer term plans call for Wang to support IBM's SNA Distribution System (Snads) and offer an IBM Token-Ring Network Interface for its VS line of minicomputers, according to a company statement of direction.

Support for LU 6.2 marks a strategic turnaround for the minicomputer maker, which as recently as last year said it did not intend to support the interface, according to David Terrie, editor of Patricia Seybold's *Network Monitor*, an industry newsletter. IBM is trying to standardize LU 6.2 as a universal interface to SNA.

The Wang Office/Disoss Gateway is being enhanced with the LU 6.2 option in two stages, software Release 1.5, due in July, and Release 2.0, scheduled for availability in the fourth quarter. With both releases, LU 6.2 is offered as a transport option in place of the currently supported Information Distribution Services (IDS).

IDS is a host resident software package that began shipping two months ago. It enables Wang VS processors to use the library services of Disoss, according to Paul Demko, director of data communications and networking. Wang documents translated into IBM's Document Content Architecture and Document Interchange Architecture — the building blocks of Disoss — can be stored, searched and retrieved from Disoss libraries. The IDS gateway also enables VS processors to communicate using an IBM SNA network.

The LU 6.2 interface available with the Wang Office/Disoss Release 1.5 provides a gateway between Wang Office and Disoss without requiring Wang software on the host. Without IDS, however, the ability to tie VS processors together using SNA as a transparent transport is lost. Wang recommends use of LU 6.2 for users that simply want to gateway to Disoss, and IDS for customers who, for example, want to be able to use one VS to log on to a remote VS.

Release 1.5 also improves upon Wang's Disoss gateway by enabling users of either transport option to send a 256-character message to other users informing them of filed documents. Without Disoss distribution services, users cannot directly exchange documents.

Release 2.0 adds Disoss distribution services to both LU 6.2 and IDS. It also enables users to exchange so-called final form documents, a lock-out feature that prevents document editing. Support of Distribution Services will enable Wang users to directly exchange documents of up to several hundred pages, though communications are still required to go through an IBM host.

Providing Library and Distribution Services distinguishes Wang from Digital Equipment Corp. and Data General Corp., its two primary competitors. According to George Colony, president of Forrester Research, Inc., a research firm in Cambridge, Mass., DEC today only supports library functions, while DG only supports distribution services.

Wang Office/Disoss Gateway costs $6,000 per VS for gateway and format translation software. LU 6.2 for the VS will cost $3,000. IDS costs $20,000 for the host resident software component and $250 per VS. An additional $1,000 fee is required for the gateway enhancement for current IDS users.

Enhancements to Wang Office enable customers to build a Wang Office directory that incorporates Wang users with Disoss and IBM Profs users. Companies that do not want to add all Disoss users to a Wang Office directory — which would enable documents to be addressed by user name — can address the document using Disoss addresses and host names.

The Wang/Profs Gateway improves on the initial product, which began shipping in January, by adding support of name addressing, the ability to exchange documents and mail between Wang Office and Profs and use of a single VS to gateway a network of VS minicomputers to an IBM environment. Wang/Profs Gateway costs $2,000 for the VS portion of the software and $20,000 for the mainframe. It will be available in July.

The concurrently announced Wang 3270 VS Logon is an option for IDS that enables customers to use an IBM 3278 terminal to access VS applications. This limits the need for duplicate terminals and enables a 3278 user to access Wang Office, Disoss and Profs from the same workstation. Due to the lack of local processing capabilities, 3278 users cannot use Wang word processing. The IBM host resident software costs $2,000.

Wang's intention to support Snads means that the company will have to build to IBM's PU 2.1, the complement to LU 6.2. Together, LU 6.2 and PU 2.1 add up to IBM's Advanced Program-to-Program Communications (APPC). APPC enables devices within a hierarchical SNA network to talk as peers without requiring host intervention. Snads will enable a Wang VS to communicate with an IBM System/36 without being routed through a host, said Wang's Demko. ☑

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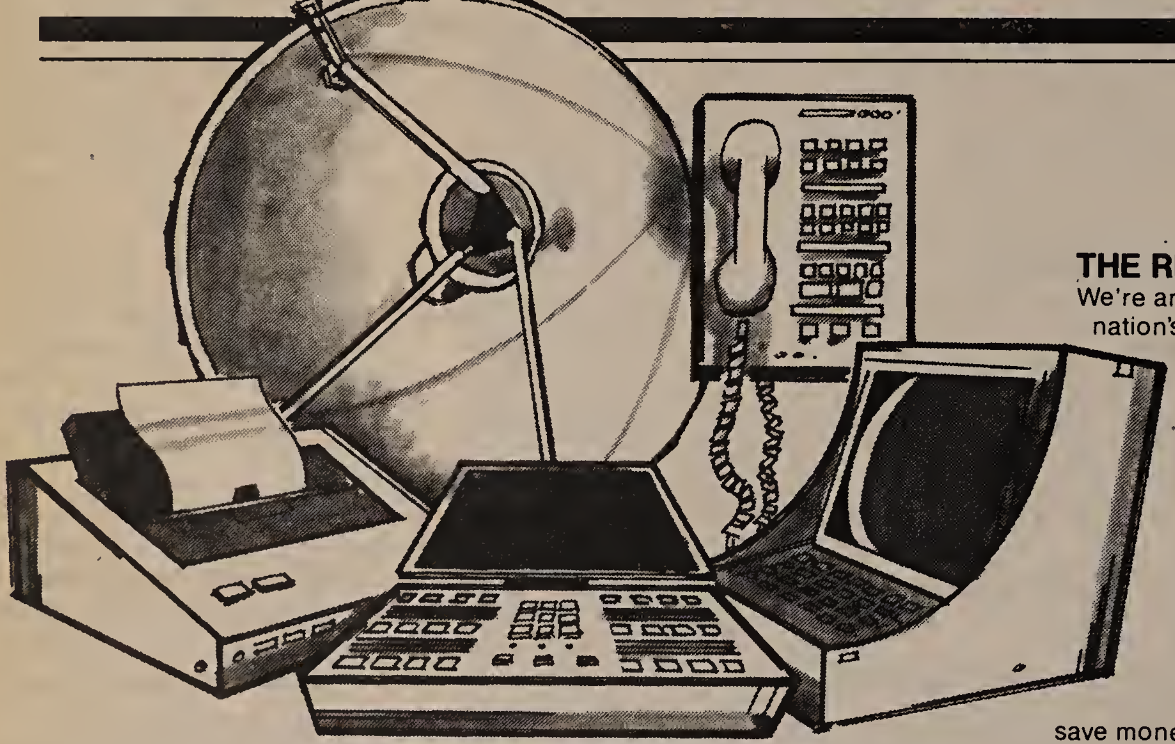

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Product Focus

* June 16 - 1,200 Bit/Sec Modems
* July 21 - T-1 Multiplexers
* Aug 18 - Network Management/Test Equipment
* Sept 15 - Broadband Local Area Networks
* Oct 20 - Baseband Local Area Networks
* Nov 17 - Communications Processors
* Dec 15 - Communications Software

Special Section

* July 7 - Fiber Optics
* Aug 4 - ISDN
* Sept 1 - Bypass
* Oct 6 - Local Area Networks
* Nov 3 - Micro to Mini to Mainframe Connections
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June 1-6, Atlanta — Telecom '86: Telecommunications - A Strategic Asset. Contact: Stephen Christie, International Communications Association, Suite 710, 12750 Merit, Dallas, Texas 75251.

June 2-4, Boston — Hands-On Network Protocols: An Advanced Approach. Contact: American Institute, 55 Main St., Madison, N.J. 07940.

June 3, New York — Telecommunications Equipment and Services Selection. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 3-4, Washington, D.C. — New Light on Fiber Optics: Supply & Demand Heats Up. Contact: Phillips Publishing, Inc., 7811 Montrose Road, Potomac, Md. 20854.

June 4, Bethesda, Md. — Data Communications for the IBM Personal Computer: Personal Computer to Personal Computer and Personal Computer to Mainframe Communications in One Day. Contact: The Institute for Advanced Computer Education, 3233 K St., N.W., Washington, D.C. 20007.

June 5-6, Orlando, Fla. — Fiber Optics in Plain English. Also, June 25-26, Hartford, Conn.; July 16-17, Los Angeles; Aug. 6-7, Chicago. Contact: R. Skinner, Clifford, Inc., P.O. Box 51, Bethel, Vt. 05032.

June 5-6, Bethesda, Md. — Installing and Using the IBM Token Ring Network and other Personal Computer Local-Area Networks. Contact: The Institute for Advanced Computer Education, 3233 K St., N.W., Washington, D.C. 20007.

June 9-10, Chicago — Computer-to-Computer: The Office Products Industry in an Electronic Age. Contact: Communications Department, National Office Products Association, 301 N. Fairfax St., Alexandria, Va. 22314.

June 9-10, Minneapolis — Networking IBM Personal Computers. Also, June 11-12, St. Louis, Mo.; June 16-17, Columbus, Ohio; June 18-19, Milwaukee. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

June 9-11, Chicago — Network Management, Control and Problem Determination. Also, Oct. 1-3, New York; Nov. 17-18, San Francisco; Dec. 10-12, Boston. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521-2939.

June 9-12, Boston — Network Management/Technical Control Conference and Exposition. Contact: Registration Services, CW/Conference Management Group, Box 9171, Framingham, Mass. 01701-9171.

June 9-13, St. Louis, Mo. — Reach for the Top in St. Louis — 23rd Annual Conference and Technical Exhibition. Contact: Nancy Montenegro, American Society for Hospital Engineering, 840 North Lake Shore Drive, Chicago, Ill. 60611.

June 12-13, St. Louis, Mo. — Data Communications and Networking for the IBM Personal Computer XT/AT and Other Compatibles. Also, July 10-11, Baltimore; July 24-25, Hartford, Conn.; July 28-29, New York; Aug. 11-12, Boston. Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

June 16-17, San Francisco — Transmission Technologies: Optical Fibers, Coax and Wire. Also, July 7-8, Washington, D.C.; July 10-11, Chicago. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

June 16-18, Washington, D.C. — Fundamentals of Telecommunications: Voice, Data and Image. Also, June 24-26, Phoenix; June 30-July 2, St. Louis; July 8-10, West Palm Beach, Fla.; July 22-24, Salt Lake City, Utah. Contact: American Institute, 55 Main St., Madison, N.J. 07940

June 19-20, Las Vegas, Nev. — Gartner Group's Fourth Annual IBM Futures Conference. Contact: Ashley Pearce, Gartner Group, Inc., P.O. Box 10212, Stamford, Conn. 06904.

June 23-27, Cambridge, Mass. — Managerial Planning for the Security and Privacy of Contemporary Computer Telecommunications Systems. Contact: Massachusetts Institute of Technology, 77 Massachusetts Ave., Room 7-338, Cambridge, Mass. 02139.

June 25-27, San Francisco — North American Telecommunications Association/West. Contact: North American Telecommunications Association, 2000 M St. N.W., Washington, D.C. 20036.

July 14-16, Chicago — Fiber-Optic Communications. Also, Aug. 6-8, New York; Sept. 15-17, San Francisco; Oct. 20-22, Boston; Nov. 3-5, Chicago. Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521-2939.

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Snet from **page 4**

O'Brien said the company views CEI as an opportunity. He said Snet would sell such open access to its networks to value-added resellers, and also to users whose premises-based PBXs have the ability to access the network directly. The company would be selling access through its ConnNet packet switching network, O'Brien said, as opposed to its backbone voice network.

The ConnNet network is made up of ANP2520s, packet assemblers/disassemblers (PADs) made by Databit, Inc., a subsidiary of Siemens Communications Systems, Inc., which are configured in remote locations across the network area. These PADs are connected into the network nodes, located in Hartford, New Haven and Stamford, over digital facilities.

Users of Snet's new 3270/SNA protocol conversion service would access the network through the ANP2520s where the protocol conversion to X.25 would be done, and the signal sent to the core Snet network for routing to its final destination. Under this scenario, only transport over the core Snet network is tariffed.

Ztel from **page 6**

state was dissatisfied with the 250-line switch, so US West Information Systems replaced it with a Neax 2400, made by NEC Corp. The regional Bell operating company subsidiary subsequently dropped the Ztel product line.

According to Jorgensen, the state of Utah has a "long-term master plan that calls for integrating some 10 buildings into a [single] network." He said the state sought "a temporary system on monthly rental and low bid," for the Department of Health, which has moved into a new building here.

Jorgensen explained that at the time the bids were sought, the legislative moratorium precluded purchase of a new system, so a temporary solution was in order. The state has been using Centrex service and, according to Jorgensen, is still considering the use of both central-office-based systems and premises-based network systems in its overall network planning.

The two-cabinet, 763-line Ztel 5400 system the state selected is capable of data transmission but carries only voice for the Department of Health, Jorgensen said. Data will be run through the switch on a test basis, he added. Ztel continues to promote the PNX as an "advanced integrated voice and data PBX system."

Last year, Ztel filed for reorganization under Chapter 11 of the Federal Bankruptcy Act. Since then, both Ztel and Skaggs Telephone Corp. of Murray, Utah, which took over as a Ztel agent on the West Coast after US West dropped the company, "performed very well on bid," Jorgensen said.

Ztel announced PNX upgrades, including:

- An account or authorization code that allows users to associate calls with specific accounts for billing.
- A voice processing, storage and messaging peripheral for the 5300 and 5400. Users may create, save, retrieve and delete voice files.
- Number of tenant partitions expanded from 12 to 64.
- Double the number of CRT-based attendant consoles supported on all PNX systems.

Supreme Court from **page 1**

agencies to set rates. The FCC had implemented accelerated schedules for equipment used in both interstate and intrastate service in an effort to encourage the deployment of advanced technology in the public network. The five-to-two court decision was a rude awakening for the FCC and seems to rein in the agency effectively and reaffirm state authority to regulate telephone companies in the area of depreciation.

The ruling could have repercussions in areas beyond depreciation rules. The FCC recently said it, not the states, has authority over whether regional telephone companies are allowed to diversify into new businesses.

But the Supreme Court last week disagreed with that view. The court made it clear that while the Communications Act of 1934 gives the FCC broad authority to regulate "interstate and foreign commerce in wire and radio communication," it does not give the FCC "jurisdiction with respect to charges, classifications or regulations in connection with intrastate communications service."

According to the Supreme Court, federal law bars the FCC from "preemption of state regulation over depreciation of dual jurisdiction property [equipment used for both intra- and interstate service] for intrastate rate-making purposes."

The Court upheld states' authority to determine telephone company depreciation rates for equipment and parts of equipment used solely in providing intrastate service. Depreciation rates for equipment used in local phone service will be determined on a state-by-state basis as a result of the ruling.

The FCC preempted state authority over depreciation allowances when it changed federal depreciation rules in 1980 and 1981 to allow for faster depreciation. The FCC accelerated the rate at which all telephone companies depreciate capital equipment to spur innovation and competition.

Under the FCC's accelerated depreciation philosophy, a telephone company could more easily justify the expense of new equipment by being able to depreciate the old physical plant at a faster rate than in the former noncompetitive environment. The cost of this accelerated depreciation was in turn passed on to the consumer.

But some states balked at the FCC's exercise of authority over them. The Louisiana Public Service Commission asked the Supreme Court to hear the case. It was joined by 26 private telephone companies and 23 state public utility commissions that petitioned the Supreme Court on this matter.

Observers estimate that 75% of a telephone company physical plant is used for intrastate service. This includes equipment owned and used by AT&T, the Bell operating companies and the host of other smaller telephone companies. Thus, 75% of equipment will fall under state-defined depreciation schedules and 25% under FCC rules.

FCC Chairman Mark Fowler responded to the Supreme Court by saying, "This is a case where the FCC called collect, and the Supreme Court reversed the charges. We are disappointed by the Supreme Court decision, which limits our authority to craft depreciation rules. Since state-of-the-art depreciation is key to creating an information age telephone network, the decision is a legal setback."

Fowler went on to say, "At the same time, I am confident the FCC can stay its pro-competition course."

Reorganization from **page 5**

will report to Randall L. Tobias, who is to become vice-chairman of AT&T on Sept. 1.

Questions remain as to how AT&T will appropriate account responsibilities between the Business Markets Group and the General Markets group. According to a company spokesman, a task force formed in February and headed by Robert J. Casale, an AT&T Information Systems vice-president, and Gus Blanchard, an AT&T Communications executive, is studying how best to combine the two customer bases and appropriate accounts among the new market groups.

The company said that of AT&T Communications' seven million business customers and the AT&T Information Systems customer base of users, only 200 large business accounts are currently served by both subsidiaries.

The task force is "still studying how we would serve those largest customers," the spokesman said,

In a prepared statement, Tobias last week said that, while he "expects some efficiencies in the reorganization," he doesn't "foresee major layoffs resulting from these moves."

Skynet from **page 2**

same spare transponders also back up AT&T's service. If the failure involved the spare capacity and the protected transponder space, however, it is possible AT&T users would be bumped.

"We do have the contractual right to use preemptible transponders to restore service to a customer leasing a protected transponder," Lewis added.

Savatiel said the roughly 100% increase in the cost of the transponders AT&T will lease from RCA Americom in 1989 has already been figured into the price users will pay for five- and seven-year fixed rate service contracts.

But users signing three-year service contracts may find that the cost for the service will be raised.

Motel 6 from **page 6**

had been made.

When AT&T's board of directors last week voted to appoint Randall L. Tobias to head both AT&T Communications and AT&T Information Systems, the company officially signaled its intention to unite these two subsidiaries into one marketing organization. Later remarks by new Chairman and Chief Executive Officer James Olson confirmed this intention.

In February, AT&T assigned Robert Casale, a vice-president for AT&T Information Systems, and Gus Blanchard, from AT&T Communications, to study how AT&T might best organize joint marketing efforts when regulatory restrictions were removed. Among other things, the study concluded the two subsidiaries share and individually serve at least 200 of their largest business customers.

According to an AT&T spokesman, although it is now free to act as one company, it hasn't yet developed procedures to guide such joint activities. The Motel 6 deal, however, appears to illustrate how the two subsidiaries are currently approaching large account situations.

Motel 6, a discount motel chain with a reported 30% share in its market segment, has locations throughout the U.S. in major cities as well as rural areas. According to Elser, a key consideration in the motel chain's decision to award the business to AT&T was its ability to provide jointly both equipment and services, as well as the company's nationwide presence.

A year and a half ago, the motel chain began a campaign to attract more business and opted to add telephone service in its more than 45,000 rooms. At that time, the company issued a request for proposals (RFP) to provide the switching and station hardware. According to Joseph McCarthy, president of the motel chain, six vendors received the RFPs. He declined to identify the vendors.

McCarthy said that the company subsequently issued a separate RFP for long-distance service to AT&T Communications and "the two other major carriers," which he declined to name. According to Elser and Dolan, the two AT&T subsidiaries began collaborating on the deal at this time, over a year ago.

Regulatory restrictions on joint marketing by AT&T Information Systems and AT&T Communications would not prevent the organizations from working together at the request of a customer, a spokesman for AT&T Communications said. In issuing the RFP to both AT&T Information Systems and AT&T Communications, Motel 6 effected such a request, the spokesman said.

According to Elser, AT&T bid several different prices for the hardware contract, as well as different warranty and maintenance options. Pricing options that were bid were formulated by an AT&T team made up of financial staff at AT&T Information Systems headquarters in New Jersey, as well as sales and marketing staff at the regional office here, he said.

▶ PRODUCT REVIEW

Small PBXs: To integrate or not to integrate

BY JOHN J. HUNTER
Contributing Writer

Many network managers are intrigued by integrated digital private branch exchanges — units that can combine digitized voice and data inputs over standard twisted-pair telephone lines. After all, it's hard to argue the value of a product that performs the functions of separate analog and data PBXs.

However, there is always the question of trade-offs. Rarely can a multifunction unit provide the same level of service and sophistication as a dedicated unit.

The more expensive digital PBXs do an equally good job with voice and data. But what about the smaller, less expensive units — the ones targeted at companies with only a couple of hundred lines? Can they provide high-quality voice and data services, or would it be better to stay with the current voice system and use a data PBX to handle data requirements? To find out, let's compare a highly acclaimed data switch, Equinox Systems, Inc.'s DS-5 Data PBX, with a much-touted voice-data switch, the Telenova 1 Digital PBX from Telenova, Inc.

The DS-5 is a data-only PBX that uses time-division switching to carry out terminal requests. Data is transferred over a backplane that has a data-handling capacity of 12M bit/sec.

A basic DS-5 can handle up to 120 lines. Equinox allows the channel-handling facility to be extended up to 1,320 lines by the addition of local multiplexers and a channel expansion unit. Two local multiplexers are offered, the LM-8 and LM-48. Both are time-division units and connect the DS-5 via multiplexer boards that fit into channel-card slots in the PBX.

The LM-48 and its accompanying multiplexer board accommodates 48 input channels, and the LM-8 provides eight channels. Using multiplexers, the DS-5 can be configured with up to 960 channels. For those requiring greater capacity, there is the EX-19 expansion unit. This unit offers an additional 19 channel card slots, but uses two for control cards linking the expansion unit to the DS-5. The combination of a fully configured DS-5 and EX-19 increases the channel-handling capacity of the unit to 1,320 lines.

The Telenova 1, by contrast, handles up to 240 lines and has no such expansion facilities. The DS-5 supports asynchronous inputs at speeds up to 9.6K bit/sec, as opposed to 19.2K bit/sec for Telenova. According to Equinox, a 19.2K bit/sec facility will be available later this year, and a 38.4K bit/sec facility is in the works. Both Equinox and Telenova input channels have an automatic baud-recognition facility to handle dial-in terminals. The DS-5, however, tops out at 9.6K bit/sec, compared with 19.2K bit/sec for the Telenova.

Equinox is also developing a synchronous data-handling facility that will accommodate all standard speeds up to 56K bit/sec. This, however, is still short of Telenova's 64K bit/sec facility, also due out by the end of this year.

The DS-5 doesn't allow users to make a permanent connection between a terminal and a port. This feature, called nail-up, is very handy for servicing devices such as printers, which have no keyboards and, therefore, no way of logging on or off. Equinox is working on a nail-up facility and will release it sometime this year. Telenova has it now.

Both the DS-5 and Telenova 1 use a central control unit that holds control logic and line-interface boards. The DS-5 line boards connect terminals to computer ports, and each board accommodates 24 lines. DS-5 line boards are available with RS-232-C, current-loop and long-distance interfaces. The latter is a modified RS-422 that handles both RS-232-C and RS-422 interfaces and allows terminals to be located up to 5,000 feet from the PBX without a line driver. In contrast, the RS-232-C limits the distance to 50 feet. Telenova supports the RS-232-C only.

The DS-5 provides excellent port contention and restriction facilities. In normal operation, any terminal can contend for any port on a first-come, first-served basis. If the port is busy, the user is notified and has the option of being placed in a queue or logging off. Queued users are notified of the number of users ahead of them and can request that the system operator move them to the head of the queue.

The Telenova 1's port-queuing technique is definitely a weak point. Although some users can be queued to a busy port, they are not told of their position, nor can they request to be moved up. To do port queuing, Telenova requires that the terminal be connected to the station set via a data adapter board. The station set's LCD panel — not the screen — indicates when the port is busy, and the call-back feature informs the user when the port is free. The disadvantage of this scheme is that a digital station set must be used for each terminal, increasing the overall system cost.

The port restriction facilities used by the two vendors are identical. Each uses terminal passwords that bar unauthorized users from logging on and keep them from accessing certain terminals. In addition, both PBXs allow users to be assigned to groups that can access only certain ports.

The Telenova 1 handles voice through a unit that incorporates a keyboard and telephone handset, called the Telenova Station Set, which digitizes the analog voice input. Digital inputs from terminals, personal computers and other devices are accommodated via a digital interface that either plugs into the station set or fits into the central control unit.

Telenova has done a first-rate job with the Telenova Station Set. The unit has only 25 keys, including the 12-button dial pad. Five of the keys are dynamic softkeys, and eight are fixed function and feature keys. It also includes a 40-character LCD that provides messages and system prompts to the user. A majority of the feature keys are used in conjunction with the display to provide a menu-driven feature activation.

Users can be prompted on the use of each key, instead of being required to memorize them. The five softkeys are defined as the need arises. For example, the display could indicate Call Waiting, and the user would activate it with a softkey. This same key could be used later to activate a call conference.

Simultaneous transfer of voice and data over a standard twisted-pair telephone line is a standard feature of the Telenova 1. In this type of transfer, 64K bit/sec is allocated for data, 64K bit/sec for voice and 16K bit/sec for signaling and control. If this sounds like the 2B-plus-D-channel format used with integrated services digital networks, you're right. According to the vendor, North American ISDN standards are embedded within the architecture of this PBX. However, users that intend to communicate with Europe should be aware that ISDN implementations there may differ significantly.

The usual PBX features, such as station hunting, call pickup groups, least-cost routing and area-code restriction, are standard with Telenova 1. Its innovative station sets can display the internal station user name rather than the number, thereby allowing a called party to quickly identify the caller. Queued calls are also identified in this manner. The Telenova 1 also uses speed-dial directories that allow users to scroll by name until the desired name and number are found.

The Telenova 1 uses two backplane buses. The circuit bus has an 18M bit/sec capacity and carries data and voice; the transaction bus has a 670K bit/sec capacity and carries signaling and control information. Transmission slots on the circuit bus are allocated in 9K bit/sec increments up to the entire 18M bit/sec capacity. These increments consist of 8K bit/sec for voice and data and 1K bit/sec for in-band supervisory signaling.

For voice inputs, Telenova uses the pulse-code modulation technique that quantizes at 64K bit/sec. Within the PBX, a 72K bit/sec channel is allocated, consisting of 64K for the quantized voice input and 8K bit/sec for in-band signaling.

The voice quantization technique uses the popular pulse-code modulation scheme, yet the product can easily handle the newer techniques such as adaptive pulse-code modulation, which AT&T Communications, Inc. will eventually require for voice channels operating over its Accunet T1.5 and Digital Access and Crossconnect System (Dacs) services.

With a product that is so heavily oriented toward voice, one would expect the data end to be a little weak. This is not the case, however. The Telenova 1 currently supports asynchronous data to 19.2K bit/sec, and 64K bit/sec synchronous capability and T-1 support are scheduled for release later this year. The T-1 link will conform to the DS-1 format and will meet the D4 and extended superframe message-framing formats, making the PBX suitable for connection to AT&T's Accunet T1.5 and Dacs.

Equinox charges $1,500 for the DS-5 Central Unit, which contains the power supply and eight slots for control cards and line interface boards. The Control Logic is priced at $3,900, and the line boards run from $1,800 to $2,400. Because each of these boards accommodates 24 lines, the per-line cost for a basic DS-5 will run between $300 and $325. Telenova could not furnish a price list because it sells through third-party sources.

The company estimates that a typical system will cost between $700 and $1,000 per line, including the Telenova Station Set units.

The Telenova 1 turns out to be a potent product for either voice or data applications. Its data-handling facilities are excellent as far as speed ranges are concerned, but the port-queuing technique needs work. Another area that needs improvement is the system's expandability. An upper limit of 240 lines is too small for a PBX with this much power.

The Equinox DS-5, overall, does a fine job in handling data switching. However, it's surprising that a product designed only for data currently does not support T-1 links and has a 9.6K bit/sec asynchronous data limitation.

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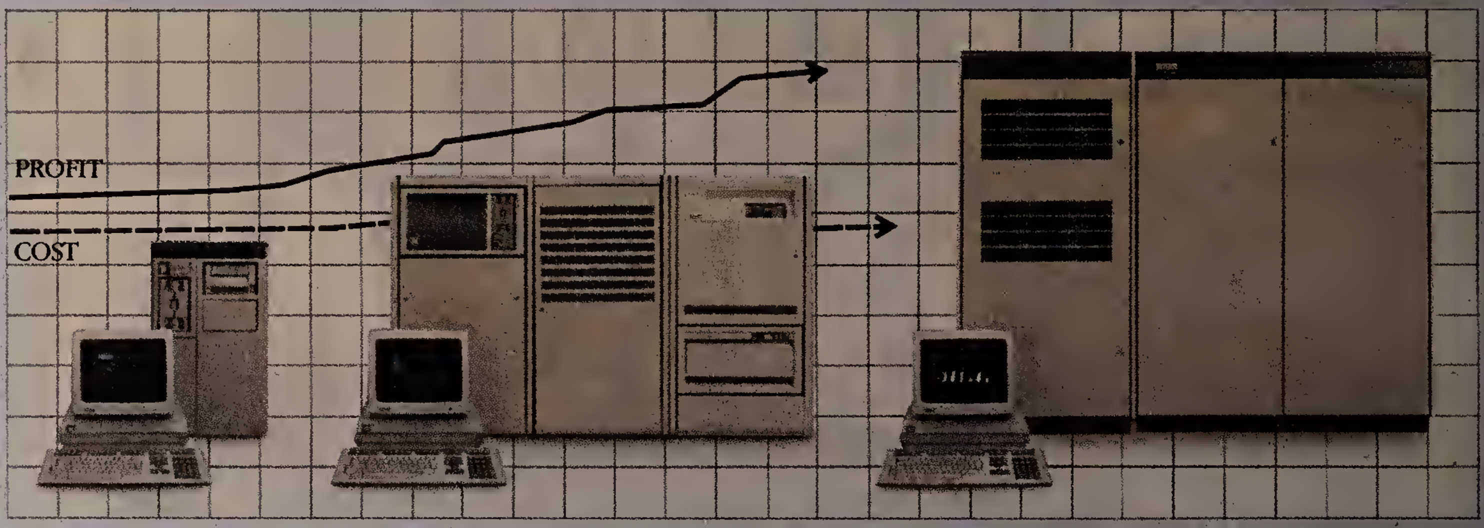

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